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ABSTRACT

This document, the second of three volumes in the U.S. Congress Office of Technology Assessment's "Adolescent Health" series, provides background information on aspects of adolescents' lives and examines the effectiveness of prevention and treatment interventions. Chapter 1, an introduction to this two-part document, provides a summary of the contents of this volume as well as an outline of the series as a whole. Part 1 focuses on the background of adolescent health and provides a framework for viewing the lives and social environments of adolescents. The three individual chapters in this part examine respectively: adolescent development that may affect health, the delivery of health services, and public policy with respect to adolescents; the families of adolescents and models of parent-adolescent interaction; and school environments and discretionary time. Each of the 10 chapters in part 2 examines a specific health problem: accidental injuries; chronic physical illnesses; nutrition and fitness problems; dental and oral health problems; Acquired Immune Deficiency Syndrome and other sexually transmitted diseases; pregnancy and parenting; mental health problems; alcohol, tobacco, and drug abuse; delinquency; and homelessness. For each chapter, sections are included on: (1) limitations of existing sources of data on the health problem, the prevalence of the problem among adolescents, and differences in prevalence by selected sociodemographic and nondemographic characteristics; (2) information on the prevention and treatment of the problem; (3) relevant federal policies and programs; and (4) conclusions and policy implications. A separate index is included for Volumes I, II, and III of this "Adolescent Health" series. (NB)

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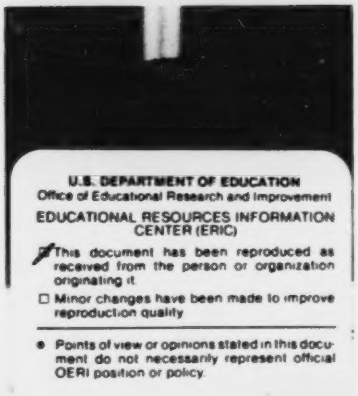

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CONGRESS OF THE UNITED STATES
OFFICE OF TECHNOLOGY ASSESSMENT

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Foreword

Adolescence, the poet suggested, "is the one age [that] defeats the metaphor." In many respects, such as legal and financial dependence, adolescents are still children; in other respects, such as physical development, they approach and then reach adult status. In part because they experience profound biological, emotional, intellectual and social changes, adolescents as a group—and some adolescents more than others—are uniquely vulnerable to the impact of many of the Nation's social policies. For numerous reasons, policymakers and the public have long struggled with the establishment of appropriate health-related policies and programs for adolescents.

OTA's report responds to the request of numerous Members of Congress to review the physical, emotional, and behavioral health status of contemporary American adolescents, including adolescents in groups who might be more likely to be in special need of health-related interventions: adolescents living in poverty, adolescents from racial and ethnic minority groups, Native American adolescents, and adolescents in rural areas. In addition, OTA was asked to: 1) identify risk and protective factors for adolescent health problems and integrate national data in order to understand the clustering of specific adolescent problems, 2) evaluate options in the organization of health services and technologies available to adolescents (including accessibility and financing), 3) assess options in the conduct of national health surveys to improve collection of adolescent health statistics, and 4) identify gaps in research on the health and behavior of adolescents.

Senator Daniel K. Inouye, Chairman of the Senate Select Committee on Indian Affairs, and Senator Nancy Landon Kassebaum, Ranking Minority Member of the Subcommittee on Education, Arts, and Humanities of the Senate Committee on Labor and Human Resources, were the lead requesters of OTA's adolescent health study. Requesters included Chairmen or Ranking Minority Members of the Senate Appropriations Committee, the Senate Commerce, Science, and Transportation Committee, the Senate Finance Committee, the Senate Labor and Human Resources Committee, the Senate Small Business Committee, the Senate Veterans' Affairs Committee, and the House Interior and Insular Affairs Committee; and the Chairman and six senatorial members of the congressional Technology Assessment Board. A letter of support was received from the House Select Committee on Children, Youth, and Families.

This OTA assessment is being published in three volumes: Volume I, *Summary and Policy Options*; Volume II, *Background and the Effectiveness of Selected Prevention and Treatment Services*; and Volume III, *Crosscutting Issues in the Delivery of Health and Related Services*. Volume I was published in April 1991, and Volume III was published in June 1991. Two related reports have already been issued as part of this study (see appendix A in Volume I).

OTA was greatly assisted by an advisory panel, chaired by Felton Earls, Professor of Behavioral Sciences at the Harvard University School of Public Health. Michael I. Cohen, Chairman of the Department of Pediatrics at the Albert Einstein College of Medicine in New York, served as vice chairman. In addition, many individuals from academia, the Federal Government, the private sector, and the public provided information and reviewed drafts of the assessment. OTA would like to especially thank Carnegie Corporation of New York, and its operating program, the Carnegie Council on Adolescent Development, for their generous and diverse assistance throughout the course of this assessment. Finally, the members of our Youth Advisory Panel—a group of 21 individuals ages 10 through 19, who met often with OTA staff, with OTA's advisory panel, and with workshop participants—were essential to the study. These young people provided the adolescent perspective on health concerns of importance to young people, and made valuable suggestions for improving health services and health policy. The final responsibility for the content of the assessment rests with OTA.

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NOTE: OTA appreciates and is grateful for the valuable assistance and thoughtful critiques provided by the advisory panel members. The panel does not, however, necessarily approve, disapprove, or endorse this report. OTA assumes full responsibility for the report and the accuracy of its contents.

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Volume II

BACKGROUND AND THE EFFECTIVENESS OF SELECTED PREVENTION AND TREATMENT

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INTRODUCTION

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Chapter 1

INTRODUCTION

This is Volume II of OTA's assessment, *Adolescent Health*. This volume, *Background and the Effectiveness of Selected Prevention and Treatment Services*, provides background information on important aspects of adolescents' lives and detail on the effectiveness of selected prevention and treatment interventions. Volume I is entitled *Summary and Policy Options* (2). Volume III is entitled *Crosscutting Issues in the Delivery of Health and Related Services* (3).

As shown in box 1-A, which lists the table of contents for all three volumes of the assessment, Volume II has two major parts:[1] Part I: Background on Adolescent Health and Part II: Prevention and Services Related to Selected Adolescent Health Concerns.

Part I: Background on Adolescent Health provides a framework for viewing the lives and social environments of contemporary adolescents. Chapter 2, "What Is Adolescent Health?" provides a brief overview of aspects of adolescent development that may affect adolescents' health, the delivery of health services, and public policy with respect to adolescents. This chapter notes that researchers have found that popular conceptions of adolescents as a group whose behavior is overwhelmingly determined by "raging hormones" and of adolescence as a period when to be abnormal is normal are misguided. These misconceptions are not benign: they may have deleterious effects on attitudes towards individual adolescents and on interactions with individual adolescents and on policy and program development, with neglect of adolescents being a predominant response. Adolescence is a period of profound biological, emotional, intellectual, and social transformation, and substantial societal support may be needed by adolescents and their families in order to promote healthy development. Chapter 2 also discusses conceptualizations of health, providing background for the broad conceptualization used by OTA in its assessment.

Chapter 3, "Parents and Families' Influence on Adolescent Health," addresses a most important aspect of adolescents' lives and social environments, their families. Research suggests that being the parent of an adolescent requires an approach different from that required for being the parent of a younger child. But relative to the amount of guidance and support provided to parents of infants and young children, little guidance and support are provided to parents as their children mature into adolescence. Promising models of parent-adolescent interaction are available, however, and these are reviewed in chapter 3. More research is needed on these models and on models of appropriate governmental and private support to make parents more appropriately available to their adolescent children.[2]

Chapter 4, "Schools and Discretionary Time," turns to two other important aspects of adolescents' lives. These two facets of the social environment become increasingly important as adolescents spend more time physically away from their families and testing a range of skills, beliefs, and behaviors. Although little systematic empirical research has been supported, the studies that have been conducted suggest that academic and health outcomes of adolescent students are influenced by school environments; studies of school environments and the policy implications of the studies are reviewed in chapter 4. Also discussed is the time that adolescents spend away from school in "discretionary" activities such as being with their friends, solitary leisure activities, doing volunteer work, and engaging in hobbies. Although information is again scarce, the chapter focuses on the apparent paucity of activities for adolescents that are satisfying to adolescents, conducive to healthy development, and acceptable to the adult community.

Part II: Prevention and Services Related to Selected Adolescent Health Concerns includes chapters 5-14, each of which examines a specific health problem of concern to policymakers, the public, parents, and, to varying degrees, to adoles-

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[1] *Volume I—Summary and Policy Options* was published in April 1991 (2), and *Volume III—Crosscutting Issues in the Delivery of Health and Related Services* was published in June 1991 (3). An order form for all three volumes is at the back of this publication. Copies for congressional use only may be obtained by contacting OTA.

[2] Family factors found to be specific to the occurrence of particular problems (e.g., pregnancy and parenting; alcohol, tobacco, and drug use; delinquency; homelessness) are discussed in the risk factors sections of the chapters in Part II of this volume.

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Box 1-A—Full Table of Contents for OTA's Adolescent Health Report

VOLUME I: SUMMARY AND POLICY OPTIONS

Appendixes

A. Method of the Study
B. Acknowledgments
C. Issues Related to the Lack of Information About Adolescent Health and Health and Related Services
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VOLUME II: BACKGROUND AND THE EFFECTIVENESS OF SELECTED PREVENTION AND TREATMENT SERVICES

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3. Parents and Families' Influence on Adolescent Health
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11. Mental Health Problems: Prevention and Services
12. Alcohol, Tobacco, and Drug Abuse: Prevention and Services
Prevention and Services Related to Delinquency and Homelessness
13. Delinquency: Prevention and Services
14. Homelessness: Prevention and Services

Appendix

A. Glossary of Abbreviations and Terms

VOLUME III: CROSSCUTTING ISSUES IN THE DELIVERY OF HEALTH AND RELATED SERVICES

15. Major Issues Pertaining to the Delivery of Primary and Comprehensive Health Services to Adolescents
16. Financial Access to Health Services
17. Consent and Confidentiality in Adolescent Health Care Decisionmaking
18. Issues in the Delivery of Services to Selected Groups of Adolescents
19. The Role of Federal Agencies in Adolescent Health

Appendixes

A. Glossary of Abbreviations and Terms
B. Burden of Health Problems Among U.S. Adolescents
C. HCFA's Method for Estimating National Medicaid Enrollment and Expenditures for Adolescents

cents themselves: accidental injuries (ch. 5); chronic physical illnesses (ch. 6); nutrition and fitness problems (ch. 7); dental and oral health problems (ch. 8); AIDS and other sexually transmitted diseases (ch. 9); pregnancy and parenting (ch. 10); mental health problems (ch. 11); alcohol, tobacco, and drug abuse (ch. 12); delinquency (ch. 13); and homelessness (ch. 14). As discussed in each chapter, the problems reviewed do not constitute the entire set of possible adolescent health problems; rather, the intent of the chapters is to provide detail on selected problems illustrative of important policy

Box 1-B—Summary of Major Policy Options Related to Adolescent Health

In Volume I of this Report, OTA suggests a range of options that could be implemented in an effort to help improve adolescent health, broadly defined (2). Three major options that OTA believes Congress may want to consider are as follows:

1. improving U.S. adolescents' access to appropriate health services,
2. restructuring and invigorating Federal efforts to improve adolescent health, and
3. improving adolescents' environments.

Strategies to improve U.S. adolescents' access to appropriate health services include:

- support the development of centers that provide, in schools and/or communities, comprehensive and accessible services designed specifically for adolescents—e.g., by providing seed money, continuation funding, or removing existing financial barriers;
- increase financial access—e.g., by expanding Medicaid to immediately include all poor adolescents, by increasing access to private insurance, and by increasing outreach for Medicaid;
- increase legal access to health services—e.g., by supporting the development of a model State statute, or requiring or conditioning States' receipt of Federal moneys for specific programs on substantive changes in consent and confidentiality regulations;
- increase support for training for the providers of health and related services; and
- empower adolescents to gain access to health and related services—e.g., through education and encouraging adolescent participation in the design of services.

Strategies to restructure and invigorate Federal efforts to improve adolescent health include:

- create a new locus for a strong Federal role in addressing adolescent health issues;
- strengthen traditional U.S. executive branch activities in: 1) program development for promising or neglected areas of intervention, 2) research, and 3) data collection.

Strategies to improve the social environment for adolescents include:

- increase support to families of adolescents—e.g., through tangible supports such as child allowances or more flexible working hours, and through providing information on appropriate, health-promoting parenting for adolescents;
- support additional limitations on adolescents' access to firearms;
- support the expansion of appropriate recreational opportunities for adolescents; and
- monitor the effects on adolescents of the implementation of the National and Community Service Act of 1990.

In addition to these major options and strategies, which cut across the areas examined by OTA, a number of topic-specific policy options are listed in Volume I of the Report.

OTA notes that, apart from whatever specific strategies the Federal Government may adopt to improve adolescents' health, there is a need for a basic change in approach to adolescent health issues in this country, so that adolescents are approached more sympathetically and supportively, and not merely as individuals potentially riddled with problems and behaving badly.

issues. This detail provides support for the major policy options discussed in Volume I of this assessment (see box 1-B).

Each of the 10 chapters in Part II follows a similar format. A background section in each chapter discusses *limitations of existing sources of data* on the adolescent health problem that is the focus of the chapter. It is important to note that OTA generally found data limitations to be considerable.[3] Using available sources of data, the background section of each chapter also provides information on the *prevalence of the problem* among adolescents. These sections typically provide support for OTA's conclusion that individuals may encounter signifi-

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[3] See app. C, "Issues Related to the Lack of Information About Adolescent Health and Health and Related Services," in Vol. I, for a synthesis of limitations in available data.

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cant health problems during the course of adolescence.[4] Also presented in the background section of each chapter is available information about *differences in prevalence by selected sociodemographic characteristics* (e.g., age, gender, race, ethnicity, social class, and residence) and *nondemographic risk factors* (e.g., family factors, community and peer influences, biological factors, adolescents' beliefs and attitudes). These sections provide support for the importance of targeting interventions to adolescents based on demographic characteristics and other risk factors but also for the conclusion that many adolescent health problems (e.g., alcohol use, suicide) cut across a wide variety of ages, races, ethnicities, and social classes.[5]

The primary focus of OTA's analyses in the 10 chapters in Part II of this volume was to determine the *effectiveness of prevention and treatment interventions* for adolescent health problems. Thus, each chapter in Part II has sections on the prevention and treatment of the health problem that is the focus of the chapter. Information is presented on the appropriateness of prevention and treatment interventions and problems adolescents may encounter in gaining access to services. Particular attention is paid to the effectiveness of interventions, in terms of improved health outcomes for adolescents. Evaluations of preventive interventions for adolescents suggest that many of the interventions are not based on available knowledge about risk factors, and that too many interventions rely on attempts to change individual behavior, when research—albeit limited[6]—has shown that primary preventive interventions based on automatic protection and other environmental change (e.g., legislation and regulation) are more effective than those that rely solely on education and persuasion. Too little attention has been paid to secondary prevention through early intervention: adolescents face many barriers to gaining access to needed health services.[7]

Each of the 10 chapters in Part II also includes a section on Federal policies and programs that are most relevant to the health problem discussed in the chapter. Federal agencies' attention to adolescent health problems has varied over time and by topic, with much attention now being paid to illicit drug use and preventing sexual activity. OTA's analysis identifies a number of problems with the Federal approach to adolescent health topics. A major problem is the very limited attention being paid by Federal agencies to providing adolescents with needed health and related services. Another problem is that the sheer number of congressional committees and U.S. executive branch agencies and programs contributes to fragmentation in data collection, research, and service delivery related to adolescents.[8]

Finally, it should be noted that each chapter in this volume ends with *conclusions and policy implications*. Specific legislative *options* pertinent to each of the issues discussed in this volume (and in Volume III of this assessment) can be found in *Volume I—Summary and Policy Options* (2). Appendix A of this volume is a glossary of terms and abbreviations.

The way OTA went about conducting the assessment—including lists of workshop participants and members of OTA's Youth Advisory Panel for the assessment—is described in appendix A of Volume I. The many individuals who assisted OTA in the development of the three volumes of this Report are listed in appendix B of Volume I. The congressional requesters of the assessment are listed in box 1-C below.

Chapter 1 References

1. Osgood, D.W., and Wilson, J.K., "Covariation of Adolescent Health Problems," paper prepared under contract to Carnegie Council on Adolescent Development and Carnegie Corporation of New York, for the Office of Technology Assessment, U.S. Congress, Washing-

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[4] For a review of the research on *covariation* in adolescent health problems, see Osgood and Wilson (1). Covariation is the tendency of health problems to occur in the same individual at about the same time. Most of the evidence on covariation of adolescent problems is based on cross-sectional studies, so it is still unclear for many problems whether one problem leads to another or the problems occur together, due to a single cause or set of causes. Another limitation of the evidence on covariation is that most of the evidence is limited to covariation in adolescent behaviors and does not consider emotional or physical problems. Nonetheless, there is evidence for statistically significant covariation among several adolescent health behaviors (1).

[5] A tabular summary of prevalence data and capsule statements of adolescents most at risk (usually in terms of demographic characteristics) for the problems discussed in this volume can be found in app. B, "Burden of Health Problems Among U.S. Adolescents," in Vol. III of this Report (3).

[6] The fact that the research on environmental change is limited is in part related to the fact that much of the literature on risk factors limits itself to studies of individual or, at most, family factors. It is also difficult to evaluate the impact of global environmental changes on adolescents specifically.

[7] Barriers to health services are discussed in each chapter and in Vols. I and III of this assessment (2,3).

[8] An overview of Federal programs relevant to adolescent health can be found in ch. 19, "The Role of Federal Agencies in Adolescent Health," in Vol. III of this Report (3). Major policy options related to the Federal role in adolescent health are presented in Vol. I (2).

Box 1-C—Requesters of OTA's Adolescent Health Report (with current committee chair or ranking minority assignments)

Senator Daniel K. Inouye, Chairman of the Senate Select Committee on Indian Affairs;
Senator Nancy Landon Kassebaum, Ranking Minority Member of the Subcommittee on Education, Arts, and Humanities of the Senate Committee on Labor and Human Resources;
Senator Bob Dole, Minority Leader of the Senate;
Senator Robert C. Byrd, Chairman of the Senate Committee on Appropriations;
Representative William H. Gray, III, Majority Whip of the House of Representatives;
Senator James M. Jeffords, Ranking Minority Member of the Subcommittee on Labor of the Senate Committee on Labor and Human Resources;
Senator Orrin G. Hatch, Ranking Minority Member of the Senate Committee on Labor and Human Resources;
Senator Edward M. Kennedy, Chairman of the Senate Committee on Labor and Human Resources;
Senator Quentin W. Burdick, Chairman of the Senate Committee on Environment and Public Works;
Senator Mark O. Hatfield, Ranking Minority Member of the Senate Committee on Appropriations;
Senator Alan K. Simpson, Assistant Minority Leader of the Senate;
Senator Alan Cranston, Chairman of the Senate Committee on Veterans Affairs;
Senator Ted Stevens, Ranking Minority Member of the Senate Committee on Rules and Administration;
Senator Bob Packwood, Ranking Minority Member of the Senate Committee on Finance;
Senator Charles Grassley, Member of the Technology Assessment Board;
Senator Barbara Mikulski, Chairman of the Subcommittee on Veterans Affairs, Housing and Urban Development, and Independent Agencies of the Senate Committee on Appropriations;
Senator Ernest Hollings, Chairman of the Senate Committee on Commerce, Science, and Transportation;
Senator Arlen Specter, Ranking Minority Member of the Subcommittee on Veterans Affairs;
Representative Henry A. Waxman, Chairman of the Subcommittee on Health and the Environment of the House Committee on Energy and Commerce;
Senator Daniel K. Akaka;
Representative Morris K. Udall, Chairman of the House Committee on Interior and Insular Affairs;
Senator Frank H. Murkowski, Vice Chairman of the Senate Select Committee on Intelligence;
Senator Christopher J. Dodd, Chairman of the Subcommittee on Children, Family, Drugs, and Alcohol of the Senate Committee on Labor and Human Resources;
Senator Claiborne Pell, Chairman of the Senate Committee on Foreign Relations;
Senator Dale Bumpers, Chairman of the Senate Committee on Small Business;
Senator Lloyd Bentsen, Chairman of the Senate Committee on Finance;
Senator Daniel P. Moynihan, Chairman of the Subcommittee on Social Security and Family Policy of the Senate Committee on Finance;
Senator John D. Rockefeller, IV, Chairman of the Subcommittee on Medicare and Long Term Care of the Senate Committee on Finance;
Representative Don Young, Ranking Minority Member of the House Committee on Interior and Insular Affairs.

A letter of support was received from the House Select Committee on Children, Youth, and Families.

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ton, DC, 1990 (Springfield, VA: National Technical Information Service, NTIS No. PB 91-154 377/AS).

2. U.S. Congress, Office of Technology Assessment, *Adolescent Health: Volume I—Summary and Policy Options*, OTA-H-468 (Washington, DC: U.S. Government Printing Office, April 1991).

3. U.S. Congress, Office of Technology Assessment, *Adolescent Health: Volume III—Crosscutting Issues in the Delivery of Health and Related Services*, OTA-H-467 (Washington, DC: U.S. Government Printing Office, June 1991).

Part I:

BACKGROUND ON ADOLESCENT HEALTH

Chapter 2

WHAT IS ADOLESCENT HEALTH?

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Chapter 2

WHAT IS ADOLESCENT HEALTH?

Introduction

Although analyses by OTA and others certainly suggest a need for attention to the health of U.S. adolescents, it is important to note that what is *meant* by adolescent health is still not all that clear (37,56). Considerations of the meaning of adolescence and the way the health of adolescents is conceptualized are important, because such conceptions have significant consequences for:

- judgments about how healthy adolescents are;
- judgments about which adolescent health problems are most important;
- judgments about what health-related policies are justified; and
- decisions about the development of measures of health and health services utilization that are in turn used to help judge the need for changes in services and policies.

Conceptualizations of health are important in considering the health of any segment of the population, but because of the unusual social status of adolescents (55), unique issues are raised. This chapter provides a brief overview of some of the basic changes that occur during adolescence and their implications for adolescent health policy. It then discusses issues in defining health and adolescent health in particular. As discussed below, the focus of the chapter, and of this Report, is on adolescents ages 10 through 18 years.

What Is Adolescence?

For some adults, the period of adolescence is one they would rather forget (they ''learned the truth at 17''). For others, it is a period they continue to recall with happy memories (the ''Glory Days''). Probably most adults view adolescence, like other periods of development, as a period of both positive and negative experiences and emotions. But there is something about the intensity of adolescence that marks it as subjectively different from other periods. At the same time, no two adolescent experiences are alike, and ''capturing the adolescent experience'' (18) in research, and on paper, is a difficult task. This section on adolescent development reviews evidence for the notion that adolescence is ''a social construct, one that is changing even as we examine it'' (55). It then describes the basic biological and cognitive foundations of change during adolescence. The section relies heavily on chapters by Modell and Goodman (55), Keating (43), and Brooks-Gunn and Reiter (11) in the recent volume, *At the Threshold: The Developing Adolescent* (24), which should be consulted for more comprehensive analyses, and on a summary of these chapters and others by Zaslow (89).

Historical Perspectives on Adolescence

As Zaslow notes, ''our understanding of adolescence is enhanced by placing it in a historical context'' (89). Basic *physical* changes do mark the transition from childhood to maturity (see below), but the long period that we now refer to as adolescence has largely been constructed in response to economic and social changes in the last 2 centuries (55). According to Modell and Goodman, in terms of the current social status of adolescents, ''The most critical component in this evolution was the spread of schooling. . .'' (55).[1]

According to Modell and Goodman, the contemporary *idea* of adolescence in Western Europe and the U.S. emerged from particular economic and social circumstances associated with industrialization (55,89). Just prior to the industrial revolution, there was a special status for young people that

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[1] Modell and Goodman provide an interesting comparison of changes in the status of adolescents and the relative importance of schooling v. labor in Great Britain and the United States (55). This portion of Modell and Goodman's analysis suggests that it is not only economic forces, but the predominant ideology of a nation, that determines a nation's social structure (55). A comprehensive analysis of the forces that determine a nation's social structure is beyond the scope of this Report. As summarized by Modell and Goodman, the British tended to be more concerned with inculcating and maintaining ''internalized codes of behavior appropriate to one's station in life,'' while the Americans were interested in ''conveying to its citizens the sense of a capacity to master whatever situation might arise'' (55). Thus, ''when American school authorities urged children to stay in school, they reflected the ideological structures that held that extended schooling meant opportunity'' (55). In contrast, the British system made decisions early on about educational and thus employment opportunities for young people. For example, until 1921, Britons as young as ages 12 and 13 could attend school for only half a day and leave school by age 14 (55). The American experience was also marked by a great influx of unskilled immigrants at around the turn of the century, with fewer requirements for the labor of children (55).

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"gave modest recognition to [youth] as [a period] of preparation for adulthood" (55). But in this period, "youth roles were almost continuous with adult roles" (55).[2] In the agrarian societies that predominated, the family was the primary economic and social unit and thus the dominant force in an individual's life.[3] Occupational choices were limited and fairly well-defined.

With the coming of the industrial revolution and the urbanization of industrialized nations, the progression from childhood to adulthood became more difficult:

> It was no longer entirely clear what steps one had to take to become an adult. The shrinking of opportunities for farming led families to encourage sons to seek other professions requiring formal training. The tradition of apprenticeship declined. Adolescents became economically dependent on the family. Adult roles were no longer inherited and prescribed, but now involved choice and initiative (89).

Whereas before young people were integral to the economic survival of their families and thus to society, they came increasingly to be seen as "marginal" (55). For a while, young people—especially those in cities—were viewed as "brash and troublesome." This perception shifted to a view of young people as "vulnerable and in need of help," and "various extrafamilial institutions came into being to help socialize individuals into the new corporate and bureaucratic world" (55,72). Chief among these extrafamilial institutions was the public high school, which was becoming an upward route into the American middle class (55).[4] Other institutions (e.g., Boy Scouts, settlement houses[5]) also became part of the child development movement.[6]

As summarized by Modell and Goodman:

> With the industrialization and urbanization of the nineteenth century, the orderly progression of young people toward adulthood became so widely problematic that concerned middle-class adults elaborated a specialized vocabulary and set up special institutions for adolescents (55).

According to Modell and Goodman, "no single individual did more to popularize and solidify adolescence as a critical developmental phase than G. Stanley Hall," the psychologist and author of the 1904 volume *Adolescence: Its Psychology, and Its Relations to Anthropology, Sex, Crime, Religion, and Education* (28,55). According to Modell and Goodman, Hall's volume "contributed to the cooperation in America between academic psychology, the rapidly spreading public school bureaucracy, and the lesser groupings of professionals outside the schools committed to the task of aiding child development" (55).

Hall and his followers' conception of adolescence was as a period in which a person is virtually reborn; it was "a phase of upheaval and trauma, storm and stress, corresponding to mankind's evolutionary progress from savagery to civilization" (55).[7] [8] These conceptions of adolescence also became "a powerful justification for the institutional specialization and even segregation of youth, so they might more productively act out phase-specific turmoil understood as characteristic of their age'' (55).

---

[2] The term youth was used, but it was not age-specific, and it overlapped considerably with use of the term childhood (55). "Youth" referred to "an extended stage defined by the economic status and role of the individual who was not fully dependent on his or her parents for economic support, who contributed to the financial stability of the family, but who was nonetheless not in a position to assume an independent adult role and set up his or her own household" (55). Individuals as young as age 12 or as old as age 24 could be referred to as youths, but the term children encompassed individuals ages 18 or 21 and younger (55).

[3] Modell and Goodman note the tradition of "fostering out" that seems contrary to the dominance of the family of origin (55). Children who were "fostered out" worked in other households while they were aged 12 to 15. This tradition provided "further training in economic roles, [and] a transitional period toward independence but within a family setting" (89).

[4] Eventually, the "total high school experience [became] romanticized as an episode of irreplaceable social and personal discovery. The high school popularized a new image of youth. . .as a creative and progressive life stage" (74). The reality of the contemporary high school experience varies considerably, of course. Evidence for the impact of middle and high school environments on adolescent health is reviewed in ch. 4, "Schools and Discretionary Time," in this volume.

[5] Settlement houses were institutions providing various community services, especially to large city populations.

[6] At about the same time, there was concern about the fate of children on a national level. The establishment of a Children's Bureau in the U.S. executive branch is described in ch. 19, "The Role of Federal Agencies in Adolescent Health," in Vol. III.

[7] To Hall and his followers, each stage of life corresponded to the developmental process of the human race as a whole (55).

[8] As discussed elsewhere in this Report, this formerly popular notion has been discredited (24). Such notions led to the view that poor health, in particular, poor mental health, odd behavior, and subjective distress, were to be expected during adolescence.

It is usually more difficult to characterize contemporary times than to reflect on historical changes.[9] As noted above, there are many adolescent experiences, in the past (55) and in modern times (12a). It seems fair to say that many of the changes in conceptualizations and social structure of adolescence that occurred following the industrial revolution (e.g., 28) persist today. As summarized by Modell and Goodman:

> At the beginning of the twentieth century, most youth were in the work force, not in school.[10] Good behavior was positively sanctioned not by promises of future utility and reward but by immediate payment and preferment. Bad behavior was sanctioned negatively not by physical or social humiliation but by the threat of dismissal. At the same time, marriage was typically far in the future,[11] and a youth's commitment was solidly to the family of origin.
>
> There were many points of tension in the turn-of-century transition pattern. . .The modal adolescent increasingly found herself or himself at school, and his or her perceived needs and deficiencies changed accordingly. School, unlike the work force, is an age-segregated institution which, by its nature, focuses on socializing young people for adult roles. . .In th[e school] setting, adolescence has evolved as a transitional period of preparation for adulthood (55).

In late-20th century United States, there is some ambiguity about social expectations during adolescence (box 2-A), although there continues to be considerable age-segregation of youth. Staying in school until high school graduation (typically age 18[12]) or, increasingly, beyond (i.e., college or graduate school) is the preferred norm[13] (87). There is increasing concern that adherence to this norm results in the neglect of the millions of young people who do not go on to college—the so-called ''forgotten half''[14] (87), as well as to a prolonged sense of rolelessness among young people who remain in school (60a). The young people who do not go on to college and who obtain jobs[15] may be better able than young people still in school to perceive themselves as adults in some respects (i.e., they are more financially independent), but the reality is that the initial earning power and the long-term prospects for advancement of these young people have declined considerably in comparison with the earning power and prospects for advancement of young

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[9] As Modell and Goodman, note, however, ''social-historical accounts are rarely definitive''; thus, a chapter like theirs is necessarily interpretive (55).

[10] In 1900, U.S. males typically left school at age 16 and entered the work force at age 15.5; British males left school at age 13 and entered the work force at age 14 (55).

[11] The typical age of marriage for U.S. females in 1900 was 22.5 years; in 1960, it was about 20 years; and in 1980, about 24 years (55).

[12] Without attempting to come to a definitive definition of adolescence, OTA decided to focus this Report on 10- through 18-year-olds. Many individuals have begun puberty by age 10, and health issues of young adolescents have been relatively neglected. While the legal age of majority is 18 in most States (and thus many 18-year-olds are legally adults), many adolescents are still in high school at age 18 and thus are more or less dependent. High school completion continues to define the end of adolescence in many ways; age 18 is used as a surrogate marker for high school completion. As discussed in the W.T. Grant Commission report, the fact of high school graduation or legally becoming an adult creates a whole new set of contingencies and opportunities for addressing health issues (87). OTA felt that attempting to address these issues as well as those affecting younger adolescents would compromise its overall effort; however, this does not mean that the post-high-school period is not potentially fraught with health-related difficulties and does not deserve attention (58,87).

The Report tries to be as specific as possible in referring to adolescents of different developmental stages. However, much of the research refers to adolescents of unspecified ages. When ages are indicated, the adolescents involved in the research are more likely to be older than younger adolescents. As a general matter, 10- to 14-year-olds are considered early adolescents, 15- to 17-year-olds are considered middle adolescents, and 18- to 21-year-olds are considered late adolescents (e.g., 18). But, as discussed below, age is not an ironclad indicator of developmental status.

[13] In 1988, 80 percent of U.S. 25- to 29-year-olds, and approximately 70 percent of those 25 and older, had been graduated from high school and had some college (76). Many individuals finish high school and go on to college, but do not complete 4 years of college. In 1988, 60 percent of U.S. 25- to 29-year-olds had completed at least 12 years of high school, but had less than 4 years of college; 20 percent had completed 4 or more years of college (76).

[14] The calculation that ''half'' are forgotten is based on the 20 million 16- to 24-year-olds in the U.S. population who have not graduated from high school or gone on to college and who are unlikely to go to college (87). Note that this calculation is somewhat different from calculations of the numbers who have been graduated from high school or gone to college by age 25 or older (76).

[15] In June 1991, unemployment rates for young U.S. workers ages 20 to 24 were 9.9 percent for whites and 22.7 percent for blacks (83). In June 1991, unemployment rates for adolescents ages 16 to 19 were 17.5 percent on average (19.9 percent for white males), and 33.7 percent for blacks (37.4 percent for black males) (83). Unemployment rates are calculated only for those who are looking for employment; they do not include adolescents attending school or keeping house, or adolescents who are discouraged workers, defined as persons who did not look for work because they believed that no jobs were available in the area or that no jobs were available for which they could qualify (83).

Box 2-A—Examples of Differences in the Legal Status of U.S. Adolescents by Category of Activity

Although the age of majority is 18 in all States but three (Alaska, Nebraska, and Wyoming, where it is 19), adolescents can legally assume adult-like rights and responsibilities at different ages. Depending on the privilege or obligation in question, and, sometimes, the State in which they live, adolescents:

- are able to work part time at 14, full time at age 16[1] (84);
- are able to leave school at 14, 16, 17, or 18, depending on the State[2] (76);
- can be licensed to drive at age 14[3] or 16 (2a);
- are able to buy cigarettes at age 17 (80);
- are able to sign contracts at age 18[4];
- are able to consent to health care at age 18 or 19, except in five States[5] (27,75a);
- are able to vote at age 18 (Public Law 91-285);
- must enlist for draft at 18 (males) (Public Law 96-107); and
- are able to buy alcohol at age 21 (78).

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[1] These are the basic minimums for nonagricultural industries set by the Fair Labor Standards Act of 1938 (Chapter 676 of the U.S. Code) (84). Different standards for agricultural industries, family farms, and hazardous occupations, as well as restrictions on hours worked, are summarized in the U.S. General Accounting Office report on child labor violations (84).

[2] As of 1988, only one State (Mississippi) permitted individuals to leave school at age 14 (76). Thirty-two States ended compulsory school attendance at age 16 (76).

[3] There are restrictions in the States that allow driving at age 14, but the restrictions vary (2a). In some of the States that allow driving at age 14, the driver merely must have completed an approved driver education course (e.g., in Idaho) or must have a guardian's or parent's consent to get the driver's license (e.g., Nevada). In other States, 14-year-old licensed drivers must be accompanied by an older licensed driver (e.g., aged 18 in Wyoming; aged 21 in Arkansas).

[4] In three States (Alaska, Nebraska, and Wyoming), the age of majority is 19. See ch. 17, "Consent and Confidentiality in Adolescent Health Care Decisionmaking," in Vol. III.

[5] Five States (Alabama, Kansas, Rhode Island, South Carolina, and Oregon) have enacted statutes that specifically authorize minors who have reached a designated age—ranging from 14 to 16—to consent to health care. In general, the body of law governing the allocation of authority for health care decisionmaking concerning adolescents is large and complicated and there are many exceptions to the common law rule that parental consent is generally required for the medical or surgical care of a child who has not reached the age of majority. See ch. 17, "Consent and Confidentiality in Adolescent Health Care Decisionmaking," in Vol. III (75a), and Gittler et al., "Adolescent Health Care Decision-Making: the Law and Public Policy" (27).

people who go on to college (87).[16] The impact of "rolelessness" on adolescent health is less well-documented, but anecdotal evidence suggests that it may be considerable.

In addition to the lengthening of adolescence, biological changes in the past 2 centuries, induced by the control of infection and better nutrition, have caused adolescence to begin earlier, at least in the biological sense (29,52). According to McAnarney, recent decreases in the average age of menarche have occurred at approximately 3 months per decade (52). Thus, at the turn of the century, the average age of menarche in the United States would have been about $14\frac{1}{2}$ years of age, approximately 2 years older than the current average of about $12\frac{1}{2}$ years (29,70). As discussed below, maturation of the reproductive glands (e.g., the ovaries and testes) begins at about ages 9 to 10, before overt signs of reproductive maturity such as menstruation (68). Thus, individuals are becoming reproductively mature at earlier ages. Although she is in the minority with respect to the *upper* age bound for adolescence,[17] Baumrind suggests with good reason that contemporary adolescence can be said to span ages 10 through 25, with biological markers indicating the younger age boundary and social changes (end of postsecondary education, marriage) indicating the upper boundary (6).

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[16] According to the W.T. Grant Commission's analysis of data from U.S. Census Bureau Current Population Surveys, between 1973 and 1986, real mean annual earnings of 20- to 24-year-old civilian males not enrolled in school declined 42 percent for those without a high school diploma, 28 percent for high school graduates, 16 percent for those with some college, and 6 percent for college graduates (87). Another comparison of census data on average earnings of slightly older groupings of males (males ages 25 to 34 and 35 to 44) from 1979 and 1986 found results that were similar, though not as striking (61).

[17] Other boundaries on adolescence include ages 10 to 20 (2); ages 10 to 18 (39); ages 10 to 18 and 10 to 19 (3,58); and ages 12 to 17 (46).

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Photo credit: Capitol Hill Arts Workshop, Washington, DC

Adolescence is a period of profound biological, emotional, intellectual, and social transformation.

In the contemporary United States, the core "developmental tasks"[18] of adolescence can be said to be the following (18):

- becoming emotionally and behaviorally interdependent, rather than dependent;
- dealing with emerging sexuality;
- acquiring interpersonal skills and preparing for mate selection;
- acquiring education and other experiences needed for adult work roles; and
- resolving issues of identity and values.

Societal expectations may make appropriate completion of the developmental tasks difficult by at the same time: 1) expecting all adolescents to take one developmental pathway; 2) sending ambivalent messages about the completion of adolescence and the beginning of adulthood; and 3) lending relatively little support for coping with developmental changes.

A return to a more structured, family-dominated, agrarian life in the United States, and thus a more well-defined adolescence, is unlikely; in any event, it would be foolhardy to romanticize pre-20th century life for young people (35). But in considering public policy related to adolescents, it is important to recognize that, as a consequence of economic and social changes, the years of preparation for adulthood in *contemporary* times may be "fuller, tenser, and more overwhelming for the young people moving through them" (55); they may also span a longer portion of an individual's life. As noted by Modell and Goodman in the conclusion to their chapter, "these observations may be somewhat troubling to readers," but the notion that adolescence is a social construct "should not deflect our attention. Rather, the malleability of adolescence points to the deep importance of understanding its attributes within a concrete context;. . . . [y]oung people. . . need more guidance from caring and watchful adults" (55).[19]

Succeeding parts of this section provide a brief review of basic physiological and cognitive foundations of change that occur during adolescence. The recent book *At the Threshold: The Developing Adolescent* provides a more comprehensive review of the knowledge base on adolescent development (24). Understanding these changes is basic to understanding the experiences of contemporary adolescents.

Basic Physiological Changes in Adolescence

Physical development, in particular "the spectacular development of the reproductive system" (69) permeates every aspect of development during adolescence, especially early adolescence (11,24,69). The progression of physical development during adolescence has been well-described (see 11,69), but the physiological *mechanisms* responsible for initiating and regulating maturation and bodily growth, and the environmental factors that may interact with biological ones to enhance or impede maturation are still not fully understood (11,68).

Overt Physical Changes in Adolescence

Figures 2-1 and 2-2 present several of the critical overt physical aspects of the developmental course of adolescence in relation to each other: the height spurt, the beginning of menstruation (menarche), breast development, and pubic hair development in adolescent females (figure 2-1); and the height spurt, penile and testicle development, and pubic hair development in males (figure 2-2). In females, the height spurt takes place between 9.5 and 14.5 years on average; menarche between 10.5 and 15.5 years on average; breast development in five stages

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[18] *Developmental tasks* are skills, levels of achievement, and social adjustment considered important at certain ages for the successful adjustment of the individual, and for the individual to progress to the next "stage" of development (e.g., adulthood).

[19] The idea that it is important to understand the current social context for young people was also reflected in the W.T. Grant Commission report on youth ages 16 to 24 who do not go on to college: "The world around us has changed, but our institutions have not responded with the flexibility required to help lay a new foundation under young families and their children" (87).

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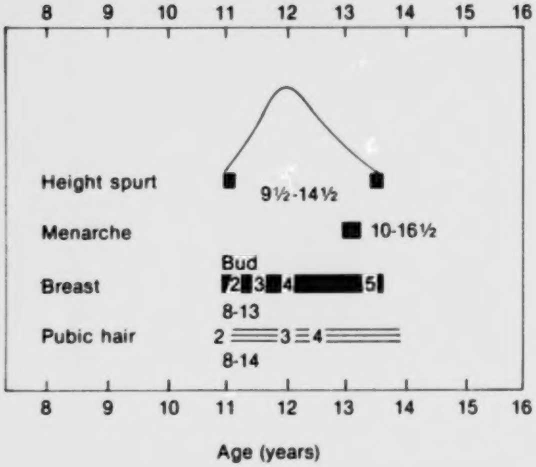
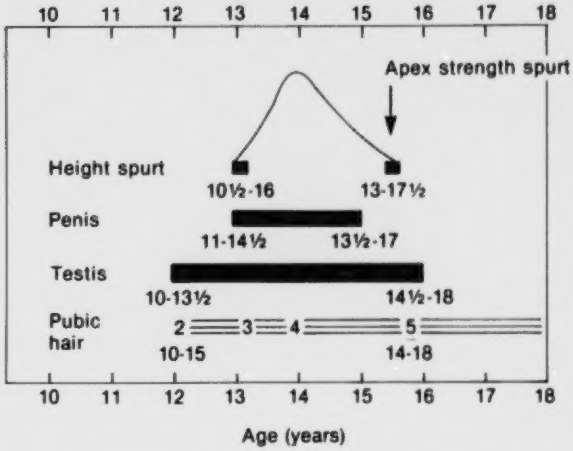
Figure 2-1—Sequence and Timing of Four Key Pubertal Events During Adolescence: Adolescent Females[a]



[a] Note that the figure indicates averages, ranges, and the normative sequence for four specific events. The horizontal lines and rating numbers marked pubic hair stand for its advent and development. The rating numbers for pubic hair indicate stages of pubertal development (69). The appearance of the breast bud is as a rule the first sign of puberty in the female, though the appearance of public hair may sometimes precede it. Stages of breast development are incorporated within the solid line to the right of the word breast. The range of times for appearance of the breast bud, the beginning of pubic hair, menarche, and peak volicity in height are shown directly under those events (69).

SOURCE: J.M. Tanner, *Growth at Adolescence*, 2d ed. (Oxford, England: Blackwell Scientific Publications, 1962). Reprinted with permission.

Figure 2-2—Sequence and Timing of Four Key Pubertal Events During Adolescence: Adolescent Males[a]



[a] Note that the figure indicates averages and ranges for four specific events, as well as the average sequence of four pubertal events, as follows: The solid areas marked penis and testis represent a general picture of the period of accelerated growth of these organs, and the horizontal lines and rating numbers marked pubic hair stand for its advent and development, with the rating numbers for pubic hair indicating stages of pubertal development (69). Figures for the range of ages at which the spurts for height and for penis and testis growth begin and end are inserted underneath the first and last points of the curves or bars. The acceleration of penis growth, for example, begins on average at about age 13, but sometimes it occurs as early as 11, and sometimes as late as 14½. The completion of penis development usually occurs about age 15, but sometimes at 13½ and sometimes at 17. At ages 13 and 14, there is an enormous variability among any group of boys, who range practically all the way from complete maturity to absolute preadolescence. The sequence of events, though not exactly the same for every adolescent male, is much less variable than the time at which the events occur (69).

SOURCE: J.M. Tanner, *Growth at Adolescence*, 2d ed. (Oxford, England: Blackwell Scientific Publications, 1962). Reprinted with permission.

between ages 8 and 18; and pubic hair development in several stages between ages 11 and 14 (figure 2-1). In males, the acceleration of penis growth begins on average at about age 12.5, but sometimes as early as 10.5 and sometimes as late as 14.5 (70). According to Tanner, "the sequence of events, though not exactly the same for each boy, is much less variable than the age at which the events occur. The spurt in height and other body dimensions begins on average about a year after the first testicular enlargement [ages 10 to 13.5] and reaches its maximum. . .after about a further year. . ." (figure 2-2) (70). At various points, dramatic changes occur in other body systems (e.g., weight, facial structure and expression, brain structure) (see figure 2-3). The fact that these changes are not simultaneous is important to understanding what individuals face during adolescence.

Hormonal Changes in Adolescence[20]

In addition to confronting overt and discontinuous changes in themselves and others, with attendant concerns about being "normal," adolescents must begin to deal with sexual arousal and other internal changes (11). Prior to and during adolescence, the following normative physiological and hormonal changes occur, as summarized by Susman and her colleagues:

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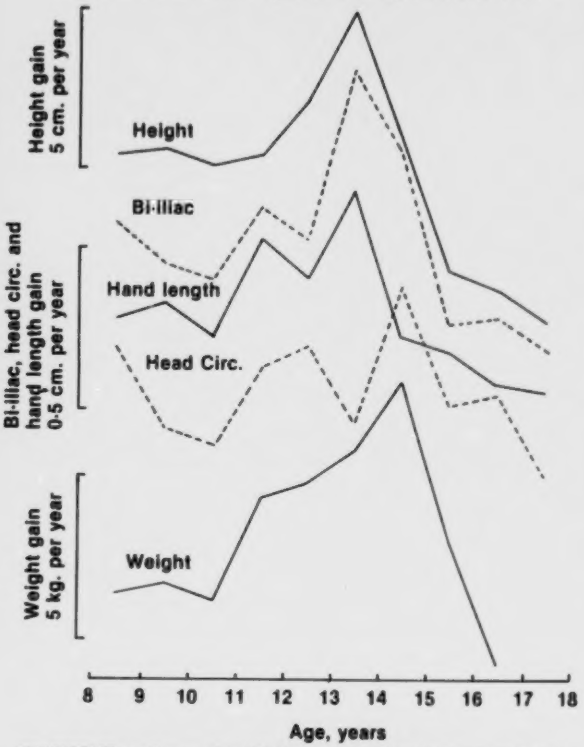
[20] *Hormones* are chemical substances, formed in one organ or part of the body and carried in the blood to another organ or part of the body, that can alter the functional activity (and sometimes the structure) of another organ or organs.

Figure 2-3—Growth Spurts During Adolescence



SOURCE: Figure 5 on p. 13 in J.M. Tanner, *Growth at Adolescence*, 2d ed. (Oxford, England: Blackwell Scientific Publications, 1962) based on L. Reynolds and G. Schoen, "Growth Patterns of Identical Triplets From 8 to 18 Years," *American Journal of Physical Anthropology* 5:165-200, 1947. Copyright © 1947 by John Wiley & Sons. Reprinted by permission of Wiley-Liss, a Division of John Wiley & Sons.

Adrenarche, maturation of the adrenal glands,[21] begins at ages 6 to 8. Following adrenarche, there is a gradual rise in adrenal androgens[22] that continues up to the age of 18 to 20, when levels reach a plateau. Adrenarche is followed in rather rapid succession by gonadarche [maturation of the reproductive organs], which is accompanied by a rise in gonadotropins[23] and gonadal steroids that continue to rise up to age 15 or 16, when adult levels are reached (68).

The physiological changes during adolescence are profound and discontinuous with earlier periods of development (68). According to Tanner, "Puberty is the time of the greatest sex differentiation since the early intrauterine months" (70). Thus, it is not surprising that a popular conception about adolescents is that they are controlled by raging hormones. Many commonly observed adolescent "attitude problems" such as talking back to teachers and parents, sullenness, moodiness, and irritability, as well as major emotional and behavioral disturbances, have been attributed to the hormonal changes that occur prior to and during adolescence (68). According to Susman and her colleagues, "the natural rise in hormone levels at puberty provides for an experiment in nature... adolescence is an ideal developmental period in which to trace the patterns of change in both hormones and behavior within a short period" (68). Unfortunately, research in this area has begun relatively recently (circa 1978), and the effects of the rise in many hormones on the behavior of adolescents generally are unknown (68). While there is some evidence that hormonal changes in adolescence influence some behaviors (see 68), there is also considerable evidence for the primary influence of prior expectations and social environment on adolescents' behavioral responses to pubertal processes (24).

As Susman and her colleagues note, "the connection between normal 'attitude' problems and hormone changes is of major concern to those individuals who are entrusted with the socialization of youth" (68). She and her colleagues suggest that additional resources and effort be put into studying the hormonal and other aspects of emotional development in normal adolescents. Important research questions include: What are the mechanisms whereby pubertal hormone changes affect brain development and behavior during adolescence? To what extent is adolescence continuous or discontinuous with other periods of development? What is the causal role of hormonal variations in adolescent mood fluctuations? As noted elsewhere in this Report, very few

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[21] The *adrenal glands* are endocrine glands situated near the kidney that produce steroids like sex hormones (e.g., estrogen, testosterone, estradiol), hormones related to metabolic functions, and adrenaline.

[22] *Androgens* (or androgenic hormones) are male sex hormones such as testosterone, which is responsible for inducing and maintaining secondary male sex characteristics.

[23] *Gonadotropins* are hormones that act upon the gonads (e.g., follicle-stimulating hormone, which stimulates the growth of follicles containing ova [eggs] and activates sperm-forming cells).

Box 2-B—In Search of Self: Identity Development in Adolescence

The development of an integrated, positive, yet realistic identity has long been considered a hallmark of healthy emotional and social development; optimally, much of this development takes place during the adolescent years (23). Harter's recent review of the process of identity development during adolescence in *At the Threshold: The Developing Adolescent* (32) helps to encapsulate the subjective meaning for adolescents of some of the basic processes described in other chapters in that volume (11,43,55).

An adolescent's emerging ability to think abstractly makes it possible to imagine "ideal" selves, which can be compared to perceived actual selves. Yet the same cognitive changes that can facilitate the journey of self-development during adolescence make its navigation difficult. Like inconsistencies between the real world and the ideal world (24,43), substantial inconsistencies between one's actual and ideal selves can be a cause of extreme subjective distress (35), as is evident from the following synthesis of a self-portrait at mid-adolescence:

> What am I like as a person? Complicated! I'm sensitive, friendly, outgoing, popular, and tolerant, though I can also be shy, self-conscious, and even obnoxious. Obnoxious! I'd *like* to be friendly and tolerant all of the time. That's the kind of person I *want* to be, and I'm disappointed when I'm not. . .
>
> Sometimes I feel phony, especially around boys. Say I think some guy might be interested in asking me out. I try to act different, like Madonna. I'll be flirtatious and fun-loving. And then everybody, I mean *everybody* else is looking at me like they think I'm totally weird! Then I get self-conscious and embarrassed and become radically introverted, and I don't know who I really am! Am I just trying to impress them or what? But I don't really care what they think anyway. I don't *want* to care, that is. I just want to know what my close friends think. I can be my true self with my close friends. I can't be my real self with my parents. . .
>
> At least at school people treat you more like you're an adult. That gets confusing, though. I mean, which am I, a kid or an adult?. . . (32).

As summarized by Harter:

> This personal narrative exemplifies numerous prototypic features of self-description during middle adolescence. . .. We witness an introspective self-portrait that is couched in the language of traits of the self—obnoxious, tolerant, introverted, popular, cheerful, depressed—many of which appear to be contradictory. We glean that the display of different selves in different social contexts is cause for concern, as the adolescent struggles to reconcile these different selves as well as determine which is the 'real me.' Experimenting with one's persona. . .is typically an emotional experience for the adolescent preoccupied with the challenge of self-definition. . . (32).

Federal resources are dedicated to studying normal adolescent development.[24]

Cognitive Changes During Adolescence

The evidence suggests that the early adolescent period is a key juncture in the development of human cognitive capabilities, in that, across the age range of 11 to 14, "what was previously a minority of successful reasoners becomes a majority" (43,89).[25] Thus, in contrast to younger children, adolescents:

- show an increased ability to generate and hold in mind more than one complex mental representation;
- show an appreciation of the relativity and uncertainty of knowledge;
- tend to think in terms of abstract rather than only concrete representations;
- show a far greater use of strategies for obtaining knowledge, such as active planning and evaluation of alternatives; and
- are self-aware in their thinking, being able to reflect on their own thought processes and evaluate the credibility of knowledge sources (43,89).

Although these changes clearly give adolescents an advantage over younger children in daily decisionmaking, the process of going through these changes may be difficult for some adolescents and

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[24] See ch. 19, "The Federal Role in Adolescent Health," in Vol. III, which notes that under 7 percent of the budget of the National Institute for Child Health and Human Development (National Institutes of Health, Public Health Service, U.S. Department of Health and Human Services) is devoted to adolescent issues. Much of this is problem-oriented rather than focused on normal development.

[25] This is consistent with the evidence (sparse though it may be) on adolescents' reasoning during health care decisions (see ch. 17, "Consent and Confidentiality in Adolescent Health Care Decisionmaking," in Vol. III). Also see Mann, Harmoni, and Power (49) whose review found that transitional periods for shifts in decisionmaking tend to fall at about 11 to 12 years, and again at 15 to 16 years.

Harter notes further that these processes "do not occur within an introspective vacuum" (32). Peers, parents, and teachers are important sources of expectations, evaluations, values, directives, feedback, and social comparison (32). Others have noted that adolescent experiences can vary considerably in different gender groups (26) and racial groups (66a,71).

An important contribution of work on the process of identity development by Harter and others is the finding that the dramatic changes in the conceptions of self that occur during adolescence do not occur overnight; important changes occur throughout the adolescent period (13,32). The most subjectively distressing shift appears to occur around ages 14 or 15, when individuals not only detect inconsistencies across what they perceive as their various selves (e.g., their behavior in relation to parents, friends, romantic partners), but "are also extremely troubled and conflicted over these contradictions, much more so than are the youngest (around ages 11 to 12) or oldest (around ages 17 to 18) groups" (13,31,32). For example, the youngest adolescents, who are apparently unconcerned about potential contradiction, make remarks such as "Well, you are nice to your friends and then mean to people who don't treat you nicely; there's no problem" (31,32). By about age 17 or 18, many adolescents have reached an accommodation with their different "selves" and can make such statements as: "Sometimes it's fun to be rowdy, but at other times you just want to be in a quiet mood; you really need to do both with really good friends" (31,32).

Harter refers to these shifts as "normative" because they typically happen in a normal adolescent; however, certain deficiencies in an adolescent's social and psychological environment may interfere with their occurrence. In addition, although these shifts are normal, some of them are accompanied by significant subjective distress while they occur. As Harter points out, it is a "myth" that these "normal" changes necessarily produce happy outcomes in the short run (e.g., 21). Further, adolescents may act out these possible selves (22,62), and this role experimentation can "usher in another potential source of tension among multiple selves" (32).

To summarize, the elements of self and identity development during normal adolescence include differentiation of the self into multiple domains (e.g., scholastic competence, athletic competence, physical appearance, social acceptance), the construction of actual and ideal selves, and the integration of multiple self-concepts into a unified self-theory (32). It is no wonder that adolescents often evidence a preoccupation with the self (17,32,40,41).

SOURCE: Office of Technology Assessment, 1991, based on S. Harter, "Adolescent Self and Identity Development," *At the Threshold: The Developing Adolescent*, S.S. Feldman and G.R. Elliott (eds.) (Cambridge, MA: Harvard University Press, 1990).

the adults in their lives. For example, while Keating's review concludes that, in general, the 11- to 14-year-old range is the period during which a minority of generally successful reasoners becomes a majority, he also finds some evidence that there is a period in early adolescence that Keating terms "rampant relativism." That is, when early adolescents first begin correctly to give a "can't tell" response to logical syllogisms, they also give such an answer when, indeed, there *is* a valid conclusion—and one that younger children can infer (43). Keating suggests that this may be a necessary cost of becoming a critical reasoner. Additional research is needed on this apparent propensity to question everything, which is a familiar one to parents of early adolescents. Box 2-B suggests some of the necessary difficulties adolescents face as they apply cognitive changes to the process of thinking about themselves.

The origins of these new or more developed abilities and strategies are an important research question with practical implications for educating adolescents and for their abilities to make decisions affecting their health. For example, whether and how physiological and cognitive changes may be related is still a matter in dispute (19,43,68).[26] According to Keating, the available evidence indicates that changes in cognitive ability occur gradually with age and over time, rather than showing a sudden onset or irreversible stepwise increments (43,89). But, as Keating notes, at the beginning of the 1980s, research on adolescent thinking could easily have been organized around a few central questions, but

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[26] For example, Susman and her colleagues note that gonadal steroids are thought to affect brain development during adolescence, and changes in cognitive abilities are hypothesized to be related to changes in gonadal steroids, although the findings reviewed by Susman and her colleagues in 1987 were not consistent across studies (68). According to Keating, while theories of brain maturation associated with pubertal development continue to arise, the evidence has not been found sufficient to support some of the changes in educational policy that have been suggested (43).

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"since then, accumulating evidence from a variety of perspectives has strikingly expanded the questions that must be considered and [has] made consensus a more distant goal" (43).

One major change in conceptualizations of adolescent thinking has been the lack of independent support for Piagetian stage theories of cognitive development. Piaget theorized that the changes in thought processes in adolescence reflected internal structural changes in the ability to think logically *regardless of content*. Although Piaget, his colleagues, and others found evidence of sequential *changes* in children's abilities to make logical inferences, the identification of structural changes in logic as the source of the age-related changes has proved problematic (43).[27] There are other potential limitations on the cognitive abilities of younger children that researchers have not been able to rule out as accounting for changes in individuals' cognitive abilities, such as memory capacity or efficiency, content knowledge differences, and task familiarity (43).

There is a practical implication of the lack of evidence for cognitive developmental stages as such. One common use of the Piagetian model was to view age-related shifts as placing *limits* on the ability of adolescents to think logically or critically (43).[28] On the contrary, much of the research has shown that "supportive contexts and early attention to the development of reasoning are precisely what is required to increase the likelihood of its emergence" (43). For example, Vygotsky has found that many differences in cognitive performance may be related to identifiable features of the cognitive environment (86,44).

Nonetheless, Keating concludes that the current research provides "encouraging" evidence that higher order thinking among adolescents is *attainable* (43). The caution, he says, is that desirable cognitive outcomes are neither easily nor automatically attainable. Positive outcomes have largely been achieved in controlled situations in which ample time is given to solve problems. In the real world, adolescents' and adults' "spontaneous thinking" is rarely as systematic, reflective, or intentional as in controlled situations (14).[29] At a practical level, then,

> . . . it would be foolhardy to assume that cognitive interventions for adolescents could rely on highly active and reflective engagement with demanding material. Yet attempts to encourage such higher-level engagement, if carried out systematically, do offer considerable promise.

The implications of research on adolescent thinking for the delivery of health care services and health-related education to adolescents seem clear. Adolescents cannot be expected to automatically have the cognitive wherewithal to understand disease processes and the increasingly complicated delivery of health services. As is true with adults, a certain amount of ability to draw inferences and make reasonable decisions will depend on adolescents' experience and the *accumulation* of knowledge. The context in which the knowledge is delivered also appears to be important (86). But rather than assuming that adolescents are incapable of making health care decisions,[30] the working assumption might be that adolescents have the capacity and can be taught to do so in a participatory fashion (43). Certainly, it would be preferable for parents to be the teachers of this information, but often parents and children experience discomfort in discussions of sensitive topics or are themselves not knowledgeable (11).[31] Thus, schools and a broad range of health service providers could broaden their roles as educators. Such an expansion of roles

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[27] The tenets of Piaget's theory have been well-described (43). As summarized by Keating, "Piaget focused on the development and organization of logicomathematical operations through four major stages or periods: the sensorimotor functioning of infancy; the preoperational, largely egocentric thinking of early childhood; the concrete operational logic of middle and later childhood; and the formal operational logic that characterizes adolescence and adulthood" (43). Further, "the cognitive operations within any given stage are organized in a structure; thus, stage changes imply shifts in underlying structure brought about through the constructive interaction of the individual with the physical and social world. . .This progression is presumed to be universal and invariable" (43).

[28] Similarly, Epstein's theories about possible whole brain growth spurts inspired a move in education to delay challenging coursework until late in adolescence (19,43).

[29] Both Keating (43) and Koslowski and Ogaki (45) find that adolescents are more similar to, than different from, adults in drawing causal inferences. Level of education appears to make a difference as well, with non-college-educated adults scoring between sixth- and ninth-graders (47).

[30] The legal presumption that minors are incompetent to make health care decisions is discussed in ch. 17, "Consent and Confidentiality in Adolescent Health Care Decisionmaking," in Vol. III (75a).

[31] Also see ch. 3, "Parents and Families' Influence on Adolescent Health," in this volume.

Photo credit: Benjamin Smith

Available evidence suggests that higher-order thinking among adolescents is attainable, but it is neither easily nor automatically achieved. Attempts to encourage higher level cognitive engagement require intensive, systematic efforts that involve real-world content.

would, however, have training[32] and cost implications.

A Perspective on Adolescent Risk-Taking

An area important to the delivery of health services (particularly health education) that is related to research on cognitive development is the area of adolescent *risk-taking*.[33] As noted in a recent review of adolescent risk-taking by Furby and Beyth-Marom, ''Although there is little empirical research on adolescent decisionmaking and risk taking, there is no paucity of beliefs about how to characterize adolescent behavior in these areas'' (26b). In their review of the empirical literature relevant to these beliefs,[34] Furby and Beyth-Marom conclude:

> . . . there is as yet little evidence that adolescents are more likely than adults to engage in behavior that seems risky to them. That is, there is little evidence that they seek out or are willing to accept greater risks. However, neither is there clear evidence that they do *not* seek or accept greater risks. The lack of empirical evidence on this issue reflects, in large part, the dearth of information on how adolescents (and adults) perceive the options they do consider [and] the likelihood of [the options'] possible consequences. . .This lack of information on option and consequence perception and evaluation is not surprising, given the methodological difficulties involved in measuring these variables. However, without better evidence, it is hard to justify the [perception] that teenagers are particularly prone to seek out or accept risks. . . (26b).

Knowledge about adolescent risk-taking and decisionmaking is important in considerations of adolescent health policy. For example, Furby and Beyth-Marom raise the possibility that, instead of being poor decisionmakers, many adolescents may be making rational decisions, *given the existing conditions and contingencies* (26b).[35] If adolescents are engaging in faulty decisionmaking, it seems reasonable to focus on improving their capacity to make better health-related choices, for example, with training in decisionmaking.[36] If, on the other hand, adolescents are, from their own perspectives, making rational choices, the emphasis should be on encouraging changes in the social structure that would make health-generating choices more likely among adolescents (26b).[37]

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[32] For example, Keating notes two findings with implications for an *intensity* of effort: 1) that modest interventions have little impact (in improving formal logic); and 2) that the greatest difficulties arise when individuals are asked to reason in tasks for which there is no real content. Those who become involved in improving adolescents' cognitive development would also have to be aware of other purported aspects of adolescent thinking that may affect adolescents' abilities to make rational health-related decisions: adolescents appear to have great difficulty in attempting to achieve an integrated understanding of their personal and social experiences (32,42,64) and adolescents may have a specific form of egocentrism in which they assume themselves to be the focus of most other people's perspectives much of the time (17). (Keating notes that the latter model is intuitively appealing but has little empirical support (43).)

[33] Furby and Beyth-Marom provide definitions of risk and risky behavior: ''The term *risk*. . .refers to a chance of loss, that chance being greater than 0 percent but less than 100 percent. Thus, the definition of *risky behavior* . . .is action (or inaction) that entails a chance of loss'' (26b). They note that risk taking ''may or may not be deliberate. That is, one may or may not be conscious that a given behavior entails a non-zero probability of loss'' (26b). Furby and Beyth-Marom's perspective on risk taking is based on a decision-making perspective: ''Decision theorists define decision making as the process of making choices among competing courses of action. . . The normative models of decision theory prescribe the processes that people should follow in order to have the best chance of maximizing their well-being, given their beliefs and values'' (26b). (Furby and Beyth-Marom also provide a review of other perspectives on risk taking (e.g., risk taking as sensation-seeking).)

[34] The following, according to Furby and Beyth-Marom, are some common myths about adolescent decisionmaking and risk-taking: 1) adolescents are not capable of competent decisionmaking; 2) adolescents take more risks than do adults, and their risk taking endangers their well-being; 3) adolescents do not consider sufficiently those possible consequences (of various options) that might occur in the distant future; 4) adolescents think that they are invulnerable; 5) adolescents let emotions rule their choices; 6) adolescents rely heavily on peer information and attitudes when making decisions about risky behavior (26b).

[35] For example, if all known alternative outcomes are taken into account, it may seem most rational to an adolescent female to bear a child. An abused adolescent may seek refuge in the use of alcohol or illicit drugs. Reviews of risk factors and preventive interventions related to selected adolescent health concerns can be found throughout this volume and in Vol. I of this Report (75).

A potential implication of realistically evaluating the literature on adolescent decisionmaking and risk-taking relates to adults' attitudes towards adolescents and towards particular activities. As have adolescents themselves (74a), Furby and Beyth-Marom note inconsistencies in societal attitudes around sexuality, drug use, and risk taking in general, suggesting that adults may have concerns other than adolescents' health:[38]

> Exactly what these other concerns are is an open question. . .Perhaps it is somewhat threatening to adults to see their children acquiring this new (and more equal) status. Or, perhaps these are simply behaviors about which adults are quite ambivalent themselves, being uncertain whether to condemn or condone them even in adults (26b).

A considerable amount of additional research and thinking needs to be done with respect to conceptualizations of adolescent decisionmaking and risk-taking.[39]

Summary

Adolescence is a period of profound biological, emotional, intellectual, and social transformation, which appears to be lengthening as a result of national economic demands. One difficulty in gaining the attention of policymakers for some adolescent health concerns is that adolescence is often viewed solely as a transitional period between childhood and adulthood (93). But this "transitional period" can take as long as one-seventh of the typical life span. One can argue—without coming to the conclusion that to be normal in adolescence is in itself abnormal (26a) (and, perhaps, therefore, that striking aberrations in behavior, should be ignored (88))—that contemporary adolescents deserve sympathetic societal attention, including attention to their perspectives on health, during their second decade of life.

Defining Adolescent Health

As noted in the introduction to this chapter, definitions of health have important implications for:

- judgments about the health status of any particular group;
- judgments about what health-related services and policies are justified; and
- decisions about the development of indicators of health status that are in turn used to help judge the need for services and policies.

For adolescents, these implications translate to: How healthy are adolescents? What kinds of interventions, if any, should be developed to improve their health? How shall the health of adolescents—and the effectiveness of interventions—be monitored?[40] Hence, an understanding of contemporary conceptualizations of health, and of their implications for the allocation of health-related resources, is important.

Current Conceptualizations of Health

As is adolescence, the concept of health is socially defined and subject to change. To some extent, adolescents have been affected by recent reconceptualizations of health and attributions of responsibility for health status.

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[36] As discussed below, this approach is part of the approach to health improvement that emphasizes individual responsibility.

[37] This corresponds to the health protection approach to prevention, described below and in Furby and Beyth-Marom (26b).

[38] For example, ". . .the considerable controversy over whether to make contraceptives easily available to teenagers suggests that there may be something other than the risk of pregnancy that bothers adults about adolescents being sexually active. Likewise, the much greater concern expressed about the risks some adolescents take by smoking marijuana than about the risks many more adults take by drinking alcohol. . .suggests that there may be something other than the possibility of negative behavioral or health effects that bothers adults about adolescents' smoking marijuana" (26b).

[39] Suggested directions for future research can be found in Furby and Beyth-Marom (26b).

[40] These questions are addressed throughout this Report.

A complete history of evolving conceptions of health is beyond the scope of this Report.[41] In the past century, as measures such as improved sanitation, and later, immunizations against bacterial and some infectious diseases have helped to improve life expectancy,[42] there has come to be more of an emphasis on nonphysical aspects of health and on the notion that much disease and disorder is avoidable (5a,53a,77,82a). For example, in 1948 the World Health Organization (WHO) defined health as "complete physical, mental, and social well-being, not merely the absence of disease or infirmity" (33). While the WHO definition has not been completely adopted, the accepted definition of health is, according to some observers, evolving toward including well-being as well as the absence of disease (8).

The idea that, especially for younger people, "natural" causes of death, disease, and disability had been largely replaced by mortality and morbidity related to behavior is an idea that has taken hold in the last 15 or so years (e.g., 56,60,82). However, most health data systems, health care systems, and insurance reimbursement arrangements in the United States continue to emphasize care for physical illness.[43]

The idea that much premature death, disability, and disease is largely avoidable (and even associated with behavior) should not lead *exclusively* to the notion that preventable avoidable death and disability are the sole responsibility of the individual. For example, a 1979 U.S. Surgeon General's report placed approximately equal emphasis on societal measures to protect the health of the U.S. population ("health protection"), on health promotion, and on prevention of specific diseases and disorders (77).[44] By at least 1984, however, many in the field of public health had come to recognize that much of the responsibility in health promotion and prevention had fallen to individual, rather than collective, action (5a,73) and one of the main objectives of a WHO conference in the mid-1980s was "to shift the focus from individualistic explanations of variations in health to an awareness of the *public policies* which were necessary to promote and protect health" (5a, emphasis added). Thus it was at the 1984 conference that the idea of the "healthy city" (later to become the "healthy community") took root as a WHO strategy for promoting health for all by the year 2000 (5a).

The notion that the health of adolescents is also grounded in the health of their communities is one that may be gaining momentum (e.g., 78a). For example, a recent publication by the Office of Substance Abuse Prevention in the U.S. Department of Health and Human Services sought to "provide balance to the public health model of agent, host, and environment by targeting the environment'' (78a). However, relatively few of the *Healthy People 2000* national objectives related to adolescents (or to other age groups) were objectives requiring environmental or regulatory measures to improve health (82b).[45]

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[41] Ashton recently delineated four phases in *public health* from the 1840s until the 1970s that may be useful in providing some historical context: 1) the period of *sanitary reform* (1840-1900), which responded to the miserable living conditions for the urban poor arising from the rapid urbanization that accompanied the industrial revolution (see above); 2) the period of *personal prevention opportunities* (e.g., child and family health clinics; birth control services; the provision of free milk and meals in schools) (1880-1930) that arose with advances in bacteriology and the development of immunization; 3) the *therapeutic era* (1930-1974) that arose with the advent of insulin, antimicrobials, and a later explosion of other therapeutic possibilities, which in turn, according to Ashton, coincided with "the apparent disappearance of the major infectious diseases on the one hand, and the increasing involvement of governments in the provision of health and social services on the other"; and 4) the *new public health movement* (1975-present), which can be traced to increases in longevity, recognition that a great deal of premature death and disability was avoidable, and growing awareness of the limitations of therapy (5a,53a).

[42] The life expectancy of an average American (all races, both genders) born in 1988 was 74.9 years; in comparison, the life expectancy of an average American born in the period 1900 was *approximately* 47.3 years (82a). (The figure for 1900 is approximate because it included only the U.S. "death registration area" of 10 States and the District of Columbia (82a).) In both 1988 and 1900, the life expectancy of nonwhite Americans was lower than that of whites, although the gap narrowed between 1900 and 1988. For example, in 1988, the life expectancy for black Americans was 69.2 years; in 1900, the life expectancy for Americans of "all other" races than white was 33.0 years (82a). Figures specifically for black Americans are not available for the year 1900.

[43] For examples, see ch. 15, "Major Issues Pertaining to the Delivery of Primary and Comprehensive Health Services to Adolescents," and ch. 16, "Financial Access to Health Services," in Vol. III.

[44] *Health protection* comprises strategies for health promotion and disease prevention that are related to environmental or regulatory measures that confer protection on large population groups. As most broadly defined, *health promotion* is a philosophy of health or a set of activities that takes as its aim the promotion of health, not just the prevention of disease; WHO has defined health promotion as the "process of enabling people to increase control over and improve their health" (5a). Sometimes, however, health promotion is more narrowly defined as the set of prevention efforts aimed at changing individual behavior. *Prevention* is used most often to refer to primary prevention, which is a category of health and related interventions that aim to eliminate a disease or disordered state before it can occur.

Measures of Health

Measures of the Health of Individuals

In no sense have widely published *measures* of health status in the United States approached broader and more positive definitions of health (8).[46] In the United States, the health status of the population is still measured primarily in terms of mortality or is inferred from the extent to which individuals seek care from physicians (e.g., 82a).[47] [48] There is increasing publication of behavioral risk factors as indicators of the health of the U.S. population (79).

Measures that are limited to the absence of physical health problems can be used to infer that U.S. adolescents as a group are healthy and, therefore, that they may not require health care services and other health-related resources (37,88). As noted above, a potential problem with an exclusive emphasis on individual behaviors, however, is that social and environmental factors that play a role in eliciting individual behaviors may be overlooked (8,73).

Measures of the Social Environment

The literature on health does not typically include objective measures of social and physical environments and the ways in which those factors affect adolescent health.[49] For example, precious little research has been done on how adolescents perceive their environments and the effects those perceptions have on their health (for examples of exceptions, see 20,85).[50]

The evidence that is available suggests that adolescents believe that there is considerable social ambivalence when it comes to adolescent behavior such as sexuality, alcohol, tobacco, and drug use, and other risk-taking behaviors (e.g., dangerous driving practices) (74a),[51] that many adults do not really care about them (85), that health care providers do not discuss the issues of concern to them (36,48,66),[52] and that many adults seem only to see the negative when it comes to adolescents (34). Adult observers have also noted that public attitudes toward adolescents are, if not negative, then largely unsympathetic (7,65).

Factors Affecting Conceptualizations of Adolescent Health

Apart from considerations of adolescence as a period of life, additional issues relating to the definition of adolescent health include: who defines health and health problems, the social context of the definition of health problems, difficulties in operationalizing well-being, and the potential consequences of broadening the definition of adolescent health.

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[45] For an analysis of the Healthy People 2000 objectives pertaining to adolescents, see the discussion of Major Option 3 in Vol. I, ''Summary and Policy Options,'' of this Report.

[46] For a synthesis and critique of widely published measures of adolescent health, see app. C, ''Issues Related to the Lack of Information About Adolescent Health and Health and Related Services,'' in Vol. I.

[47] The presence of a mental health problem is also considered an aspect of health (56), although Federal overviews of the health status of the population rarely include information on mental health status measures (e.g., 82a). Further, many adolescent mental disorders are defined in behavioral terms (5).

[48] Additional issues concerning the information available about adolescent health status, even using widely accepted indicators as measures, are discussed in app. C, ''Issues Related to the Lack of Information About Adolescent Health and Health and Related Services,'' in Vol. I.

[49] Ajzen notes that measurement of social and contextual factors in health and human behavior is underdeveloped (1). Although the health of communities as well as that of individuals is becoming an additional focus in changing conceptualizations of health (8), measures of a community's health appear at this point to be limited to aggregations of the health status of the community's individual members (8). For example, a recent ''consensus set of indicators for assessing community health status'' published by the Centers for Disease Control in the U.S. Department of Health and Human Services, includes only one measure of the physical environment (proportion of persons living in counties exceeding U.S. Environmental Protection Agency standards for air quality during the previous year) and one measure of the socioeconomic environment (childhood poverty, as measured by the proportion of children less than 15 years of age living in families at or below the poverty level) among 18 suggested indicators (81). Nine of the indicators are mortality rates, 4 are reported incidence rates for physical illnesses (i.e., acquired immunodeficiency syndrome, measles, tuberculosis, and primary and secondary syphilis), and 3 are ''indicators of risk factors'' (i.e., incidence of low birth weight, births to adolescents, and lack of prenatal care) (81).

[50] Also see app. A, ''Method of the Study,'' in Vol. I (75).

[51] For example, OTA's Youth Advisory Panel pointed out that while they are formally instructed to abstain from sex, drinking, and drugs, they are bombarded daily with contradictory messages from the adult-controlled media.

[52] For discussions of these studies, and analyses of the competence of health care providers in treating adolescents, see ch. 6, ''Chronic Physical Illnesses: Prevention and Services,'' in this volume, and ch. 15, ''Major Issues Pertaining to the Delivery of Primary and Comprehensive Health Services to Adolescents,'' in Vol. III.

The way that adolescent health and health problems are defined and measured greatly influences adolescents' lives, but as a generally (legally) powerless group, adolescents have very little say in the way health and health problems are defined and measured. As noted above, adolescents have been found to see discrepancies between issues of concern to them and issues likely to be discussed by health care providers and others who have the potential to affect adolescent health and make referrals to health care services. Clearly, if there is disagreement on what adolescent health and health problems are, there is likely to be disagreement on appropriate approaches to promoting health and to addressing problems.

Another factor in defining adolescent health problems is some things that are regarded as adolescent health problems are problems only in the context of the contemporary social environment (55). Possibly, for example, dropping out of high school (or not going on to college) might not be so terrible for some adolescents if jobs at living wages or other alternatives were available (87) or if academic paths were more flexible. The social environment is the product of longstanding cultural and philosophical roots in this country that are not about to be changed in a wholesale manner (9,55), but in considering what an adolescent health problem is, it is important to recognize the social environment's impact on the way adolescent health problems are defined.

A related social dilemma concerns operationalizing the concept of "complete. . . well-being" or "optimal functional status" (33,37). Although broadly acceptable definitions of complete well-being could be socially constructed, they would be difficult to devise because to a large extent complete well-being is inherently a subjective notion. Findings such as those by Malus and colleagues suggest, for example, that, in contrast to health care providers, adolescents perceived sexual intercourse, alcohol and drug use, as common occurrences, but not serious health problems (48). Malus's findings suggest a gulf between adult and adolescent perceptions of adolescent well-being. Broadening the definition of health can have implications for the organization of health services and, as a consequence, cost implications.

Summary

Clearly, the issue of defining health as a general matter across the life-span—and all the implications of that definition for intervention and resource allocation—is not yet settled. Scholars in the field of adolescent health, realizing the limitations of more traditional definitions of health and health-related interventions for that group, seem considerably more inclined to subscribe to broad definitions such as WHO's. For example, Irwin argues that a reconceptualization of adolescent health as "optimal functional status" may provide a better understanding of the broader issues affecting adolescents' health (37,53).

Issues surrounding the definition and measurement of adolescent health may receive greater attention as the findings of OTA's Report, and others related to adolescent health (e.g., 3,4,12,15,54,57, 58,59,60), are considered by local and national policymakers, parents, researchers, and adolescents themselves. Many of these issues are relevant to populations other than adolescents, but a broader definition of health is especially important for adolescents because adolescence is both a critical transitional period (24,29) and a period that comprises perhaps one-seventh of the life span, and because narrower definitions of health can lead to the neglect of important health issues during adolescence (88).

Conclusions and Policy Implications

The discussion of adolescent development in the first part of this chapter, as well as discussions of specific health and related topics later in this volume, suggest that, in attempts to define health for adolescents, is important to consider a broad range of issues and to include measures of adolescents' sense of well-being, their social environments, as well as the more familiar individual measures of physical illness, mortality, and behavioral risk factors. However, OTA found during its assessment that existing quantitative assessments of adolescent health, and even attempts to further develop definitions of adolescent health have not caught up with the conclusion that adolescent health needs to be thought of broadly (37,56).

Throughout this Report, OTA attempts to take a broad view of adolescent health. **Health is viewed in this Report in the most "traditional" terms of the presence or absence of physical disease and**

Box 2-C—Toward Improving Adolescent Health: Key Concepts Developed by Adolescent Health Scholars at the 1986 National Invitational Conference on the Health Futures of Adolescents

1. **Provide a prolonged supportive environment for adolescents.** Healthy adolescent development is fostered by providing a prolonged supportive environment during early adolescence, with graded steps toward autonomy.

2. **Devise a precise conceptualization of risk-taking behavior.** Positive as well as negative developmental and healthy outcomes are associated with certain exploratory behaviors. A more precise conceptualization of "risk taking" is needed to study and distinguish between constructive exploration and potentially destructive behaviors occurring during adolescence.

3. **Increase the focus on positive aspects of adolescence.** The major biological and psychosocial changes occurring during adolescence are not necessarily associated with negative outcomes and instability. Adolescence is not necessarily turbulent. Understanding positive growth, the acquisition of new skills and health-promoting behaviors, and the changing nature of interpersonal relationships deserves increased attention.

4. **Mutually engage with adolescents in a positive way.** Healthy development is encouraged by a process of mutual, positive engagement between the adolescent and various adults and peers. This process should occur through family and other significant adults and take place in schools, health institutions, and the community.

5. **Study adolescence in multiple contexts.** Healthy development must be studied and viewed in relation to the various contexts within which it occurs. Demographic, socioeconomic, psychological, biological, sociological, and historical factors can modify the characterization of normal development.

SOURCE: C. Irwin, "Editor's Notes," *Adolescent Social Behavior and Health* (San Francisco: Jossey-Bass, Inc., 1987).

disability; the implications of that view for interventions and the allocation of resources are discussed. As has become well-accepted in the adolescent development and health research communities, the health of adolescents is also viewed in this Report in behavioral terms—such as engagement in behaviors variously characterized as "risky," "health-compromising," "health-enhancing," or "problem" behaviors. The Report also attempts to measure health in positive terms (e.g., social competence) and health and well-being from the perspective of adolescents themselves (e.g., perceived quality of life). The influence of the social context on health-related behaviors is also discussed (e.g., families, schools, discretionary time).

In many cases, however, OTA's attempt at a broad analysis of adolescent health was hampered by a lack of data. The future of monitoring adolescent health needs to take a well-rounded approach to measuring health and the factors that affect it, rather than continuing its emphasis on mortality and behavior. In addition, the differences that occur *during* the long (10 or more years) period of adolescent development (e.g., 13) are important to integrate into an agenda for monitoring adolescent health and well-being.

In addition, it is important to continue the "renaissance" in research on normal adolescent development noted recently by the Carnegie Council on Adolescent Development (24,25,89). The Carnegie volume suggests many opportunities for such research and emphasizes three priority areas of crosscutting importance (24,25).[53]

In order to make adolescence a better period of life, it may also be important to attempt to "market" adolescents differently to the American public and to health care providers. As discussed above, many earlier hypotheses that seemed to describe universal processes in adolescent development have now been tested and found wanting (24). In the process of testing grand theories, the field of adolescent development has found that the popular conceptions of adolescents as a group whose behavior is overwhelmingly determined by "raging hormones" and of adolescence as inevitably a period of storm and stress are overstated. But on the other hand, the rapid physical change that occurs during adolescence, and the increasing ability of adolescents to think reflectively, can make adolescence a difficult period for some individuals, their parents, teachers, other adults, and their peers. Little help is provided to adolescents, and their parents and teachers, as they try to cope with these changes. Societal expectations for adolescents are inconsistent and may simultaneously restrict adolescents unnecessarily and demand from them an unrealistic level of maturity.

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[53] According to Feldman and Elliott, the three crosscutting areas of primary importance are: learning more about nonwhite youth; examining the contexts of adolescent development; and considering adolescence as part of the life course (24,25). Suggestions for future research can also be found in various reports from the 1986 National Invitational Conference on Health Futures of Adolescents (e.g., 37,39) and in a recent review by Susman and her colleagues (68).

It is important to consider the basic physiological and cognitive changes that occur during adolescence in the design of health and related services, health education, and adolescent environments generally. It is important to continuously acknowledge that adolescence is largely a social construct, and one that is continuously changing, even as we study it (55). As a starting place, the key concepts developed by participants in the 1986 National Invitational Conference on the Health Futures of Adolescents deserve additional application and testing (box 2-C).

Chapter 2 References

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Chapter 3

PARENTS AND FAMILIES' INFLUENCE ON ADOLESCENT HEALTH

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Chapter 3

PARENTS AND FAMILIES' INFLUENCE ON ADOLESCENT HEALTH

Introduction

The family has long been considered the bedrock of American society. Pictured as a place of refuge from the trials and tribulations of everyday life, the family has been praised from podium and pulpit. Poets remind us that the family "is where, when you go there, they have to take you in." It is a safe harbor, a supportive environment for personal growth and expression. And, indeed, for most people, the family is a place of succor and nourishment—if not always, then at least most of the time.

But there is a darker side to some families that belies these virtues. Life in such families can be terrifying, as violence replaces tranquility, hatred preempts love, hope becomes despair, and a corrosion of character directs the development of family members. These are the families in which nightmares are real and children and adolescents are transformed into victims of oppression.

Adolescent growth and development are deeply affected by the family environment in manifold and enduring ways—for good or for ill. This chapter explores the positive and negative influences of families on the health and maturation of adolescents. Since parents are central authority figures in most families (even during their children's adolescence, when peers' influence increases), the discussion that follows emphasizes the role of parents vis-a-vis adolescent family members. The interactions of siblings, grandparents, and other significant individuals in a variety of family structures are clearly important for adolescent health, but the body of research on their significance to adolescent health is sparse.

This chapter provides a brief overview of the changing nature of the American family, and discusses positive, then negative, influences of parents on adolescents, including maltreatment of adolescents. The chapter is intended to provide an overview of the importance of parents in the lives of adolescents. For some specific adolescent health problems, there has been considerable research on the negative impact of specific features of parent-adolescent relationships; this research is discussed in more detail in the relevant chapters in this volume.[1] It is important to keep in mind, however, that some widely held views that parents are not an important positive influence in the lives of their children during adolescence are now seen as inappropriate inferences drawn from a small body of influential writings earlier in this century. The relationship between parents and their children during adolescence is complicated and clearly differs from that between parents and their younger children. This chapter concludes that more research is needed to investigate the positive and negative features of the parent-child relationship during adolescence, and more guidance is needed for parents during this important period.

The Changing Nature of the American Family

The traditional American nuclear family is often depicted in popular culture as a father, a mother, and several children. Grandparents are depicted either as living with the family or residing somewhere nearby. The father works and the mother cares for the children and home. Today the picture of the traditional family is evolving rapidly into a pluralistic collage of alternative structures (79).

Economic and social forces have brought about significant demographic changes that are reflected in family life throughout the Nation. Divorce, for example, has made the one-parent family commonplace, and remarriage has introduced a stepparent into many homes. Over one-third of the marriages performed in 1988 were second marriages (47,93). With about half of all marriages now ending in divorce and about 23 percent of children born today born outside of marriage, 15.5 million children under age 18—including 6.7 million 10- to 17-year-olds (92a)—live with one parent. In the vast majority of cases (90 percent), children in single parent households live with their mother (47,92a).[2] [3] According to the U.S. Department of Commerce, Bureau of the Census, in 1990, only 28 percent of households consisted of married couples living with their own children[4] under age 18; in 1970, 64 percent of households consisted of married couples living with their own children under age 18 (92a).[5] Data from the Bureau of the Census's Current Population Survey indicate that 6,789,000 U.S. children under 18 (approximately 11 percent of the resident population) lived in stepfamilies in 1985 (92d). In 1986, Garbarino and his colleagues estimated that about 11 percent of all adolescents lived in stepfamilies (67).

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[1] See especially ch. 10, "Pregnancy and Parenting: Prevention and Services," ch. 12, "Alcohol, Tobacco, and Drug Abuse: Prevention and Services," and ch. 13, "Delinquency: Prevention and Services," in this volume.

New social values and fiscal imperatives (e.g., self-actualization, professional opportunities, desire for a higher standard of living) have enabled or compelled many women to work outside the home. Two-thirds of adolescents (17.5 million of those ages 10 to 17) live in households where both parents (or a single parent) work full time (92c). Group housing or similar extended family configurations are sometimes encountered. And all of these and other forms of nontraditional family structures are now part of the domestic landscape of America (3).

In addition, changes in employment are now routine, and families may move from one geographic area to another several times during the course of a decade, removing a child or adolescent from close contact with grandparents and altering the stability of peer relationships. Changes in longevity, later/delayed childbearing, and improvements in health care and nutrition have increased the number of older parents of adolescent children. The automobile and easy access to mass transit in urban areas have also provided adolescents a broader degree of mobility, and with it certain independence from parental influence. Although the specific influences of television and other electronic media on adolescents are not known with certainty, it is widely believed that adolescents are exposed to a more diverse set of messages through the media than they would be through their parents alone (92).

For parents with responsibility for their minor children, these changes can be confusing. Families modeled along traditional lines may feel embattled as they witness the changes occurring around them. Furthermore, many of the new family models have no established or tested guidelines for raising children. Instead, they place parents in the position of having to improvise without the benefit of the historical experience of others to assist them.

Neither research nor custom yields much counsel outside of the traditional nuclear setting. In fact, society tends to question (and sometimes condemn) nontraditional families, so that support is virtually nonexistent. At the same time, those in nontraditional families sometimes criticize traditional family arrangements, further adding to the confusion surrounding families in contemporary society.

Science, too, has added to the problem. New discoveries offering genetic linkages to a variety of health problems raise unanswered ethical questions about parental responsibilities for preventing hereditary conditions. There is increasing evidence, for example, that genetic factors play a role in schizophrenia, major affective disorders, and alcoholism (16,37,38,39,81,106). Genetic factors may also play a role in some cases of obesity and violent delinquent behavior.[6]

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[2] According to the U.S. Department of Commerce, Bureau of the Census, the increase in the number of family households maintained by women alone has accounted for a considerable amount of the change in family composition, especially during the 1970s (92b). About 17 percent of family households were maintained by women alone in 1990, compared with 15 percent in 1980, and 11 percent in 1970 (92b). However, it is important to note that families maintained by women do not necessarily include any dependent children. For example, these families could include a woman sharing her home with an elderly parent or any other adult relative. In about 61 percent of these families in 1990, one or more of the woman's children under age 18 was present (92b).

[3] The proportion of families with dependent children maintained by mothers alone is much higher for blacks (56 percent in 1990) than for whites (18.8 percent in 1990) (92b). About 30 percent of Hispanic family groups with children under age 18 were maintained by mothers alone (92b).

[4] *''Own children''* in a family are sons and daughters, including stepchildren and adopted children, of the householder (92b).

[5] It may be somewhat important to note that the absolute number of U.S. households increased between 1970 and 1990, from 63 million to 93 million, largely because of large increases in nonfamily households (e.g., men or women living alone) (92b). Even so, there was a greater absolute number of *family households* consisting of married couples living with their own children under age 18 in 1970 (40.3 million, or 50 percent of family households) than in 1990 (26.3 households, or 27 percent of family households) (92b). (The U.S. Department of Commerce, Bureau of the Census defines a *family* as a group of two persons or more, one of whom is the householder, related by birth, marriage, or adoption and residing together (92b). A *household* consists of all the persons who occupy a housing unit (a house, an apartment or other group of rooms, or a single room occupied or intended for occupancy as separate living quarters, that is, when the occupants do not live and eat with any other persons in the structure and there is direct access from the outside or through a common hall) (92b). A *family household* is a household maintained by a family; in addition, any unrelated persons who may be residing there are included in the count of household members (92b).)

[6] See ch. 7, ''Nutrition and Fitness Problems,'' and ch. 13, ''Delinquency: Preventions and Service,'' in this volume for further discussion.

As if these points of departure from past experience were not enough, parents of adolescents also must face an additional transition in their parenting roles. Adolescents bring challenges that may demand revision of parenting skills; as a result, parents may confront personal uncertainty about appropriate responses to adolescence. Furthermore, some parents may be experiencing significant life changes themselves. And, indeed, studies have found that the parents of adolescents feel less adequate and more anxious about their roles than do parents of younger children (2,48,101).

Positive Parental Influences on Adolescent Health

Many nontechnical books on parenting laud the role of parents in shaping the character of their children,[7] but the predominance of this theme in the popular press is not paralleled in research literature on adolescent health. Instead, most research concentrates on adolescent behaviors, attitudes, and problems and systemic or institutional approaches to problem solving. As Irwin observes, much of the existing research on adolescent health has serious limitations:

> Past research has been guided by the "storm and stress" perspective of adolescence and has focused on what goes wrong, went wrong, or is going wrong during adolescence. Less is known about what contributes to positive growth and health-enhancing behaviors (51).

To be sure, demonstrations and "projects" that marshal schools and community agencies in efforts to promote improved adolescent health abound—and some of these include family components. But the concept of the family as a front line of defense against adolescent health problems has not permeated the research or services consciousness to any significant extent. As pointed out elsewhere in this OTA Report, for example, there are few carefully evaluated primary prevention efforts that target families for the prevention of human immunodeficiency virus (HIV) infection in adolescents and virtually none that target families to prevent sexually transmitted diseases in adolescents.[8] Furthermore, in those research studies where the family is considered at length, it is usually considered in one of two contexts—either the family's economic or caregiving burden for adolescent health problems or the family's role in causing or exacerbating adolescent health problems (73a).[9] [10]

A balanced approach would seem to demand some recognition of the positive parental influence, in the majority of families, on the health and well-being of adolescents. Yet there is a clear need for additional research in this arena—for all family structures, but particularly for separated, minority, and nontraditional families (6,42,43,45,85). In 1987, Campbell noted that fewer than 5 percent of the articles in the literature on families and health were empirical studies (96). If, in fact, parents serve as role models for their children, then the behaviors of parents and the strength of adolescent behavior modeled after parents would seem appropriate areas of investigation. Unfortunately, the old adage "Like father, like son" has not been evaluated extensively from a serious scientific perspective.

The opportunities for significant research on the positive influence of parents and families on adolescent health are manifold. Examples are cited below.

Parents Who Serve as Positive Behavioral Role Models and Transmitters of Values and Information

To what extent are the values and behaviors of parents regarding health practices, personal hygiene, and safety transmitted to adolescents? Do parent models influence adolescent attitudes and behavior to any significant extent? Under what conditions are parental values and behaviors imitated by adoles-

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[7] Very few nonclinical books are written to guide the parents of adolescents, however.

[8] This point is made in ch. 9, "AIDS and Other Sexually Transmitted Diseases: Prevention and Services," in this volume.

[9] This observation, of course, is not intended to denigrate the importance of a family's financial contribution to adolescent health, nor is it intended to diminish the significance of caregiving within the family setting.

[10] In contrast, Small's review of preventive programs intended to support parents of adolescents found that most programs addressed the parental role in enforcing rules and limits and in communicating with their children; no programs addressed the basic resource provision function of parents, and very few addressed the role of parents as advocates for their children (i.e., by attempting to help parents become more knowledgeable about the availability and use of community resources) (83a). Very few of the programs had been evaluated for their effectiveness (83a).

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cents? How do a parent's positive health- and safety-related values and behaviors relate to adolescent health outcomes? If a parent always uses a seat belt, is an adolescent driver any more likely to do so? If parents have strong objections to alcohol, marijuana, or other psychoactive substance use, will the adolescent be less likely to engage in the use or abuse of such a substance? To what extent do family attitudes about sexuality affect risk of pregnancy, sexually transmitted diseases, and HIV-infection? Do sound family exercise and nutrition practices reduce adolescent problems of obesity or dietary deficiencies?[11] Are parental dental practices correlated with the presence or absence of caries in their adolescent children?

Several studies have found that adolescents agree with their parents on most basic values (7,21,53,56, 72). It has been established that parents are viewed by most adolescents as credible sources of information (17,46,74,88,105). To what extent is this credibility merited? Do parents generally transmit accurate and current information on health, mental health, and safety issues to adolescent family members, or is their information incomplete, outdated, or incorrect?

There is some evidence to suggest that parents exert a great influence on particular health behaviors of adolescents (particularly daughters) within a family (4). When one examines risk factors for adolescent pregnancy, for example, there emerges a strong relationship between the mothers' experiences and those of their daughters (70). Girls in female-headed households are more likely to have intercourse at earlier ages, as are those who have large numbers of siblings (49,109). Although the evidence is not strong, some studies suggest that open communications between parents and adolescents about sexual issues result in less sexual activity, better use of contraceptives, and parental support in seeking family planning services (27,50, 59). And Rosen has shown that parents play a major role in the decision to terminate an unintended pregnancy—particularly among young adolescents (81).[12]

What is not known is how generalizable the limited existing data on the parental influences are to subjects that have not received the close scrutiny given to the parental role in adolescent pregnancy, nutrition and fitness, or substance use and abuse. Do parental influences shape the type and quantity of foods consumed by adolescents? Are cautious parents more or less likely to raise adolescents who escape accidental injury or avoid risk taking behaviors? Are childhood handwashing and teeth-brushing drills effective in shaping the personal hygiene habits of adolescents?

Parents Who Provide Emotional/Psychological Support and Encouragement

Adolescence is a time of rapid changes.[13] Relations with peers—and particularly with members of the opposite sex—raise new and perplexing questions. Can the experiences of parents provide a useful reservoir for adolescents seeking counsel on issues surrounding dating behavior, friendships, and appropriate interactions in society? If so, under what conditions? How is such counsel best conveyed? Similarly, for those physical and emotional changes which may seem inexplicable, can parents help guide their adolescent to greater understanding and knowledge, a sense of perspective, and self-acceptance—thereby reducing unnecessary anxiety? To what extent can a parent's views about an adolescent's disability—or sexuality, or need for increased autonomy, or any of a number of other issues—enhance or impede sound psychological development in the adolescent?

Parents Who Connect Adolescents to Needed Services

To what extent do parents serve as early screeners of health care needs for adolescents, either making their own discretionary diagnoses and referrals or providing direct health care services themselves? How important are parental "home remedies" for adolescent health care? Are these parental interventions appropriate and beneficial? What role do parents play in connecting an adolescent to dental, health, and mental health services?[14] How important are the financial, transportation, and scheduling roles of parents in the connection of adolescents with needed services? What are the role and significance of family caregivers in the system of adolescent health care? How can parents become more effective in promoting the health maintenance of their adolescent family members?

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[11] Ch. 7, "Nutrition and Fitness Problems: Prevention and Services," in this volume, notes that exercise levels are similar among members of the same family and that children in obese families expend less energy than those in lean families, suggesting that family lifestyle can be a strong factor influencing healthy behavior in adolescents. However, findings such as these must be tempered by the recent finding that obesity may have a genetic component.

[12] The limited research on the effects of parental pressure on health care decisionmaking by adolescents is discussed in ch. 17, "Consent and Confidentiality in Adolescent Health Care Decisionmaking," in Vol. III. A 1988 study by Scherer and Reppucci examined the effects of parental pressure on hypothetical health decisions by adolescents ages 14 and 15 and found that these adolescents yielded greatly to parental pressure (82).

[13] See ch. 2, "What Is Adolescent Health?" in this volume for discussion of these changes.

These are just a few areas where families may be making a major, and largely unrecognized, contribution to the overall health of their adolescent members (73a). Future research should help illuminate how the "personal" family sector interacts with the public and private systems of health care, since many health problems may be first noticed in the home setting and decisions to seek professional intervention are initiated through the threshold of family concern.

Parents Who Promote Adolescents' Autonomy and Independence

As they mature, adolescents typically demand a more nearly equal and active role in family discussions and decisionmaking (87). Thus, it is perhaps not surprising that families which allow latitude for adolescent participation in family decisions have fewer problems during adolescence than more rigid and authoritarian families. According to Laurence Steinberg, a family that combines democracy with warmth and demandingness is likely to foster an adolescent's mental health:

> Generally speaking, adolescents thrive developmentally when their family environment is characterized by warm relationships in which individuals are permitted to express their opinions and assert their individuality and in which parents expect mature behavior and set and enforce reasonable rules and standards. This constellation of warmth, democracy, and demandingness has been labelled "*authoritative*." According to several comprehensive reviews of the literature on parenting practices and their outcomes, adolescents who grow up in authoritative homes score higher on indices of psychological development and mental health, virtually however defined (86).

Thus, basic questions on parent-child relationships during adolescence include: How can parents best facilitate movement toward adolescent autonomy and interdependence? What external controls should be relaxed and when should relaxation occur? Most parents continue to exercise some restrictive authority throughout adolescence. Where behavioral restrictions are imposed for health or safety reasons, to what extent are these effective? What kinds of restrictions are appropriate and under what circumstances? How can parents more effectively transfer external controls to internalized self-controls in adolescents?

Photo credit: Office of Technology Assessment

Views on the nature of adolescent and family development have undergone radical transformation. Rather than becoming detached and independent of their parents, adolescents need to learn to assume increasing responsibility and decisionmaking within the context of their close relationships, not away from them. A burgeoning body of research suggests that parents can help their adolescent children become socially and cognitively competent by adopting a style of interacting that is simultaneously stimulating, demanding, loving, supportive, and committed to the adolescent.

As summarized recently by Ooms and Owen for the Family Impact Seminar:

> Views on the nature of adolescent and family development have undergone radical transformation. Earlier research and writing about adolescence described the central [developmental] task of adolescence as . . .becoming detached and independent of, in effect 'emancipated' from, parents. Recent research has led to a reconceptualization of the developmental tasks of the adolescent stage of the family life cycle.

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[14] We do know that most childhood cancers, for example, are detected at early stages, as parents are likely to seek medical care soon after observing a health problem (100).

> Adolescents need to learn to assume increasing responsibility and decision making but within the context of their close relationships, not away from them. They must renegotiate their relationship with their parents so that they can assume greater autonomy, but they also need to remain connected with their parents in a new relationship of mutuality and friendship rather than dominance and control. Parents need to gradually 'let go,' but stay interested in their children, and provide them with continued advice and support. . .(73a).

Baumrind describes two parent types that have positive outcomes for adolescents: authoritative and democratic parents (3,6). She states:

> *Authoritative parents*, by definition, are not punitive or authoritarian. They may, however, embrace traditional values. Authoritative parents, in comparison to lenient parents, are more demanding and, in comparison to authoritarian-restrictive parents, are more responsive. Authoritative parents are demanding in that they guide their children's activities firmly and consistently and require them to contribute to family functioning by helping with household tasks. They willingly confront their children in order to obtain conformity, state their values clearly, and expect their children to respect their norms. Authoritative parents are responsive affectively in the sense of being loving, supportive, and committed: they are responsive cognitively in the sense of providing a stimulating and challenging environment. Authoritative parents characteristically maintain an appropriate ratio of children's autonomy to parental control at all ages. However, an appropriate ratio is weighted in the direction of control with young children and in the direction of autonomy in adolescence. Authoritative parents of adolescents focus on issues rather than personalities and roles, [and] they encourage their adolescents to voice their dissent and actively seek to share power as their children mature (3).
>
> *Democratic* parents are highly responsive, moderately demanding, and not restrictive. They are less conventional, directive, and assertive in their control than authoritative parents, but like authoritative parents are supportive, caring, personally agentic, and manifest no problem behavior or family disorganization (6).

The extent to which American families follow these models is not known. Research has shown, however, that adolescents in authoritative and democratic families on the average are better adjusted in terms of mental health, self-image, social integration, and ability to make independent decisions (self-directed) than their peers from *authoritarian* homes (i.e., homes in which parents exert rigid controls) or *permissive* homes (i.e., homes in which parents are either uninvolved or are lax in controlling behavior of their children) (3,5,6,15,20,44,45,63,78,86).

In the Family Socialization and Developmental Competence Project, Baumrind evaluated the consequences for children of four parental styles in terms of the children's social and cognitive competence:

- authoritative,
- authoritarian,
- permissive, and
- rejecting-neglecting (or indifferent) (6).

Preadolescent children from *authoritative/democratic* families, Baumrind found, had developed the greatest social and cognitive competence (6). Preadolescent girls from *permissive* families were less self-assertive than preadolescent girls from authoritative families, and boys and girls from permissive families were less cognitively competent than those from authoritative families. Preadolescent children from *rejecting-neglecting* families, were the least socially competent of all. Baumrind found that the effects of family structure among preadolescents varied with the socioeconomic and demographic characteristics of the family. An *authoritarian* family upbringing, for example, was more harmful, as measured in terms of a variety of social competency scales, to middle-class boys than to girls; more harmful to preschool white girls than to black girls, and more harmful to white boys than Hispanic boys (6).[15]

When children in the Family Socialization and Developmental Competence Project were adolescents, Baumrind measured the consequences of different parental styles again (using a different categorization), and the findings were similar to those for preadolescents (6). Adolescent children from *democratic/authoritative* homes were the most socially competent, and adolescents from *permissive* and *rejecting-neglecting* families continued to have the most interpersonal problems.

Researchers other than Baumrind have identified yet another type of family that frequently produces psychological dysfunction and involvement in various problem behaviors in adolescents—the *indifferent* family (63). An indifferent family is one in which the parents are uninvolved, making few, if any, demands on their adolescent family member. In this model, decisionmaking is laissez-faire and there is a low level of warmth and affection among family members.

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[15] The problems faced by many poor adolescents and adolescents in specific racial and ethnic minority groups are discussed in ch. 18, "Issues in the Delivery of Services to Selected Groups of Adolescents," in Vol. III.

Negative Parental Influences on Adolescent Health

Whereas positive family influences on adolescent health have received only scant attention from researchers, negative parental influences are more widely documented. Dysfunctional families,[16] for example, have been shown to be associated with poor diabetic control in adolescents (96). Furthermore, there is some evidence to suggest that stresses within families can "trigger" streptococcal infections or increase the severity of respiratory illnesses (12,66). And, while the "schizophrenogenic mother" concept has been largely discredited as a causal factor in major mental illnesses and replaced by genetic/biological or other theories of etiology, there is evidence that environmental factors (including family interactions, support, and stress) contribute to both the course and treatment of such illnesses (96). High levels of family conflict and lack of intimacy have been correlated with heroin abuse in adolescents (40). Some other adverse ways in which families can affect the health and well-being of their adolescent members are described below.

Parents Who Serve as Negative Behavioral Role Models and Transmitters of Values and Information

Just as parents can presumably contribute in a positive way toward adolescent development through their behaviors and values, so too can they provide negative role models. Furthermore, well-intentioned but uninformed parents may, through ignorance, provide adolescents with information that is incorrect.

Substance-Abusing Parents

Alcoholism and illicit drug use by an adolescent's parents or siblings have been shown to significantly increase an adolescent's vulnerability to becoming an alcohol or drug abuser (18,38,84,91).[17] Some research suggests that sons of alcoholic fathers may have up to nine times greater probability of becoming alcoholics than sons of nonalcoholic fathers (11,16).

Whether these increased risks are due to an inherited genetic vulnerability, adolescent identification and mimicking of parental or sibling substance use, easy accessibility to substances, or lack of family prohibitions and punishments has not been established. According to Kandel, however, parents who use alcohol can become role models for an adolescent's use of alcohol, while families characterized by lack of closeness, lack of maternal involvement in the activities of children, lack of or inconsistent parental discipline, and low parental educational aspirations for the children tend to experience greater adolescent illicit drug use (55). Kandel identifies three parental factors that help to predict initiation into drug use during adolescence: parental drug-using behaviors, parental attitudes about drugs, and parent-child interactions.

Violent Parents

The risk of a child's being physically abused increases proportionately to the degree and severity of assault between that child's parents (89). This relationship appears to carry over into the child's adolescence, although the greater physical power of abused adolescents may lead to reciprocal assault (and even parricide) in some instances (13,76). In fact, adolescents who kill their parents (and wives who kill their husbands) often do so in retaliation for abuse, usually as the culmination of a long period of mutual assault (31).

In 1980, one research group found that 18 percent of the children and adolescents they studied engaged in physical attacks on their parents (90). Since the research team interviewed mothers in half of the families and fathers in the other half, the team estimated that as many as one out of every three children in their sample hit their parents at least once during the year in which the interviews occurred. They attributed this violence to retaliation for physical abuse and mimicking of parental behavior which was itself violent. Within families where parents were categorized as "nonabusive," the rate of assault by a child upon a parent was only 1 in 400.

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[16] *Dysfunctional families* are families which lack cohesion and mutual support within a framework of affection that respects individual differences and the need for personal expression of autonomy. Such families may either stifle individuality or use inappropriate means of expressing such individuality (conflict and confrontation).

[17] For a general discussion of substance use and abuse by adolescents, see ch. 12, "Alcohol, Tobacco, and Drug Abuse: Prevention and Services," in this volume.

Parents Who Are Unable To Resolve Conflicts

Observational research shows that abusive families are behaviorally differentiated from nonabusive families mainly in their handling of the 5 to 10 percent of parent-child interactions that are negative (80). Nonabusive families are able to conclude (or at least terminate) these negative interactions quickly. Abusive families are ineffective and become enmeshed in escalating conflict.

Parents Who Do Not Have Accurate Information

Parents, in assuming a conscious teaching role or as unintentional conveyors of knowledge and attitudes, may not always possess accurate or current information. Thus, parents may sometimes inadvertently transmit erroneous "facts" or myths and superstitions, causing potential problems for the adolescent who acts on the basis of the information. The low rates for which adolescent girls seek care for dysmenorrhea,[18] for example, may be due in part to their mothers' beliefs that nothing can be done about menstrual cramps (61).

In addition, although parents are often seen as credible sources of information, they do not often discuss sensitive topics like sexuality, homosexuality, or prostitution with their adolescent family members (46,88,99). Sixty percent of U.S. parents receiving the brochure "Understanding AIDS" from the Centers for Disease Control in the U.S. Department of Health and Human Services (DHHS) did not discuss it with their 10- to 17-year-olds according to a 1988 National Health Interview Survey (97,98).

Parents Who Maltreat Adolescents

As noted earlier, some parents abuse or neglect their adolescent children, either emotionally or physically.[19]

Emotional abuse and neglect are difficult to define (31,34). Emotional abuse can involve the deliberate or unintentional assault on the emotional well-being of a dependent. Emotional neglect is the withholding of warmth, affection, and psychological support necessary to maintain sound mental health. Mild emotional abuse or neglect is difficult to differentiate from normal and occasional "ribbing" or expressions of disapproval. But in extreme cases, parents can destroy an adolescent's self-esteem or ability to cope by belittling the person and making repetitive attacks on personality traits or ego needs.

Some, emotional abuse results from well-meaning ignorance, as when a parent taunts an adolescent about acne, ascribing the condition to a failure to attend to personal hygiene. Sometimes, however, emotional abuse is pathologic in origin and may reflect a parent's need to maintain dominance and control in the face of increasing resistance by an adolescent. Like emotional abuse, emotional neglect can be innocent and unknowing. The parents of an adolescent with a disability, for example, may deny the adolescent's growing sexuality or limit his or her socialization with able-bodied peers out of protective instincts and ignorance, but the adolescent must pay the price in stunted sexual development, a more confining self-image, and restricted opportunities for emotional expression (64).

Whether resulting from benign motives or not, emotional abuse and neglect can have long-lasting adverse consequences for an adolescent.[20] In her studies of parenting styles, Baumrind has demonstrated that adolescents from families characterized by a lack of warmth and affection—families whose members are disengaged from any emotional involvement with one another—consistently rank lowest on social competency scales and highest on substance use and other problem behaviors (6).

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[18] *Dysmenorrhea* is painful menstruation and may be caused by any of several factors. See ch. 6, "Chronic Physical Illnesses: Prevention and Services," in this volume, for information on the rate at which adolescents seek care for dysmenorrhea.

[19] *Maltreatment* includes both abuse and neglect. *Abuse*, which refers to the active assault upon a dependent victim (as distinguished from violence against an individual over whom the perpetrator has no dependency relationship), may be physical, sexual, or psychological. *Neglect*, which refers to acts of omission that include failure to meet basic needs (as defined by prevailing community standards), may be either physical neglect (i.e., grievous failure to provide physical necessities such as food or clothing) or psychological neglect (i.e., failure to provide appropriate supervision or basic emotional responsiveness and stimulation necessary for development).

[20] At least one authority believes that emotional *neglect* generally has more serious consequences than emotional *abuse* for personality development (30).

Physical abuse and neglect are less elusive than their emotional/psychological counterparts and have been studied in greater depth. Wauchope and Straus have analyzed parental self-reports of "minor violence" (i.e., corporal punishment such as spanking, pushing, or slapping generally accepted as non-abusive in American communities) and found that prevalence varies with the age of recipient (104). Minor violence by parents against children increases from a prevalence of 20 percent in the first year of life, to a high of 90 percent at age 3, and then declines to approximately 15 percent by age 17. The prevalence of "severe violence"[21] exhibits a similar pattern, moving from 5 percent during the first year to a high of 16 percent at age 6, and then declining to 6.5 percent by age 17. When "hitting or trying to hit" was removed from the data, however, age differences disappeared, yielding a uniform 2 to 4 percent prevalence of physical abuse throughout childhood and adolescence.

There is some evidence that physical maltreatment is related to an adolescent's behaviors considered unacceptable to the abuser (e.g., disobeying or arguing). Libby and Bybee report that in more than 90 percent of the cases they studied, specific abusive incidents were *preceded* by negative adolescent behavior (60). One cannot tell from the existing data, however, precisely what is cause and what is effect. The precipitating behavior may itself be the result of earlier maltreatment.

As defined by the U.S. Department of Health and Human Services' National Center on Child Abuse and Neglect, *sexual abuse* of a child can take three forms: actual penile penetration; molestation with genital contact; and other unspecified acts not known to have involved actual genital contact (e.g., fondling of breasts or buttocks, exposure), or inadequate or inappropriate supervision of a child's voluntary sexual activities.

Incidence and Prevalence of Adolescent Maltreatment

Table 3-1 outlines the small body of research on adolescent victims of maltreatment. As noted in box 3-A, studies of adolescent maltreatment have several limitations related to the availability of data. Furthermore, such studies use different definitions of maltreatment.

Table 3-1 includes both surveys and small-scale studies. The surveys are as follows:

- two studies of the national incidence and severity of child abuse and neglect conducted by the National Center on Child Abuse and Neglect in DHHS—one in 1979-80 (published in 1981) (94) and the other in 1986 (published in 1988) (95);
- the annual tabulation (through 1986) of reported cases of maltreatment compiled by the American Humane Association (1), and
- two national probability samples assessed for domestic violence conducted by Straus and colleagues in 1975 and 1985 (89).

The small-scale studies include clinical and questionnaire studies of identified or suspected cases of adolescent maltreatment (34).

The National Center on Child Abuse and Neglect's study of the national incidence and severity of child abuse and neglect conducted in the late-1970s defined maltreatment as "demonstrable harm due to maltreatment" (94). Using a sample of 26 U.S. counties, this study estimated that there were approximately 650,000 cases of maltreatment (including "educational neglect"[22]) of children and adolescents in the United States. The national incidence study by the National Center on Child Abuse and Neglect conducted in 1985 defined maltreatment as instances where "a child's health or safety is seriously endangered." This study estimated that there were 1,025,900 cases of maltreatment of children and adolescents in the United States (95).

The 1979-80 national incidence study by the National Center on Child Abuse and Neglect found that 47 percent of the known cases of all forms of child maltreatment were against adolescents, who made up just 38 percent of the population under age 18 (94). A 1985 American Humane Association survey, on the other hand, found that adolescents were victims in 24 percent of all reported cases of child maltreatment (1). The discrepancy between the

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[21] Severe violence includes kicking, biting, hitting with one's fist, beating, burning or scalding, and threatening to or using a weapon.

[22] *Educational neglect* refers to the failure to provide appropriate education (e.g., through failure to enroll a dependent in school or permitting/encouraging truancy).

Table 3-1—Studies of Adolescent Maltreatment

Study[a]	Sample	Age	Types of maltreatment	Measures
Surveys				
U.S. DHHS, Office of Human Development Services, National Center on Child Abuse and Neglect, Survey of 1979, 1980	26 counties—all maltreatment cases known to professionals surveyed	0-17	All types, including educational neglect	Case records
U.S. DHHS, Office of Human Development Services, National Center on Child Abuse and Neglect, Survey of 1986, 1988	29 counties—all maltreatment cases known to professionals surveyed	0-17	All types, including educational neglect	Case records
American Humane Association, Survey of 1985, 1987	40 States' case reports of maltreatment	0-17	All types	Demographic and case records
Straus, Gelles, and Steinmetz, 1980	2,143 families	3-17	Physical abuse and "normal violence" (corporal punishment)	Conflict Tactics Scale (parents' self reports)
Gelles and Straus, 1987	3,229 families	0-17	Physical abuse	Conflict Tactics Scale
Powers and Eckenrode, 1988	1,674 reported cases (NY State)	0-17	All types (31% neglect, 42% sexual abuse, 19% physical abuse)	Protective services[b] case reports
Small-scale studies				
Farber et al., 1984	199 runaways 47 abused protective services cases	12-18	Physical abuse	Conflict Tactics Scale
Farber and Joseph, 1985	77 youth (diverse sample)	12-18	Physical abuse	a) Conflict Tactics Scale b) Structured Clinical Assessments Checklist c) Demographic background
McCormack, Janus, and Burgess, 1986	89 male runaways 55 female runaways	15-20	Sexual abuse	Interview on dealing with sexual abuse, delinquency, and demographic background
Garbarino, Sebes, and Schellenbach, 1984	27 females 35 males	10-16	All forms of maltreatment	a) Adolescent Abuse Inventory b) Child Behavior Checklist c) FACES—(family cohesion and flexibility) d) Demographics e) Adolescent Family Inventory of Life Events and Changes
Berdie and Wexler, 1984	163 families	12-17	All forms of maltreatment	Clinical assessment
Libby and Bybee, 1979	25 reported cases	12-17	Sexual abuse *excluded*	Case history based Protective Service
Lourie, 1977	70 reported cases	12-17	Physical abuse	Clinical assessment case records
Pelcovitz et al., 1984	33 cases to protective services	12-17	Physical abuse	Clinical assessment
Garbarino and Kostelny, 1989	2 neighborhoods, inner city Chicago	10-19	Physical abuse, neglect, sexual abuse	————

[a] Full citations are listed at the end of this chapter.

[b] *Protective services* are an aspect of social services designed to prevent neglect, abuse, and exploitation of children by reaching out with social services to stabilize family life (e.g., by strengthening parental capacity and ability to provide good child care). The provision of protective services follows a complaint or referral, frequently from a source outside the family, although it may be initiated by an adolescent him or herself.

SOURCE: Office of Technology Assessment, 1991.

national incidence study by the National Center for Child Abuse and Neglect and the American Humane Association survey may be accounted for by the fact that the former study included data from not only children's protective services[23] but from other agencies as well.

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[23] *Children's protective services* are services provided by a State or local child welfare agency to children and adolescents who have been identified as being abused or neglected. They may include assessment, family support services, removal from the home and placement in foster care, or similar interventions and assistance by a caseworker.

Box 3-A—Limitations of Research on Adolescent Maltreatment

Available studies of adolescent maltreatment, which includes abuse and neglect, have several limitations. Perhaps the most important is that they rely on data from official reports and self-reports. Both these data sources have serious limitations and are likely to underrepresent the extent of adolescent maltreatment. Parents who maltreat their children are unlikely to give self-reports that accurately reflect the true incidence and prevalence of maltreatment because abuse and neglect are criminal offenses. Official reports may significantly undercount the incidence of abuse and neglect because public agencies are unlikely to learn about instances of abuse and neglect that do not result in major physical injury. Furthermore, adolescent victims of maltreatment tend to be served by agencies other than children's protective services and hospitals, which makes adolescents less likely to be identified and included in the hospital and children's protective services samples. Finally, local jurisdictions may have varying degrees of competence in and fidelity to reporting abuse and neglect cases or have administrative practices that confound the data.

Yet another problem with available studies of maltreatment is that researchers have used various definitions of maltreatment, with some including and others excluding spanking, verbal abuse, and emotional abuse. The variation in definitions has made it difficult to compare data across studies and has led to contentious challenges to survey findings. Compounding the problem, communities (and laws) vary in their tolerance and acceptance of physical expressions of parental discipline; some actions deemed abuse in one area of the country may be considered appropriate—even commendable—in another.

An additional problem is that the bulk of family studies involving maltreated adolescents have been conducted on samples of white, middle-class, two-parent families. Family influences within minority populations have not been as intensively examined. As a result, ethnic, cultural, economic, and nontraditional family differences from these samples await further research.

A limitation of available studies of adolescent maltreatment for the purpose of this OTA Report is that most of these studies cite data on age groups other than the 10- to 18-year-old age group. Thus, the figures quoted from these studies typically reflect a smaller number than the actual incidence of abuse and neglect among the population focused on in this study.

SOURCE: Office of Technology Assessment, 1991.

Table 3-2 shows the overall rate of maltreatment cases known to professionals (children's protective services and other agencies) from the 1975 national incidence study by the National Center for Child Abuse and Neglect. Also shown are rates of maltreatment cases from the 1985 survey. In both surveys, known maltreatment rates were higher among older children than among younger ones.

The 1986 national incidence study by the National Center for Child Abuse and Neglect found that psychological abuse was more common among adolescents ages 12 and over than among children ages 0 to 11 (32 percent of reported adolescent cases v. 25 percent of cases reported among children) (95). Conversely, it found that physical abuse was more common among children ages 0 to 11 than among adolescents (52 percent of reported children's cases and 42 percent of adolescent cases). In a smaller clinical study, Berdie and Wexler reported that 68 percent of their sample of abused adolescents suffered emotional maltreatment, 54 percent experienced physical abuse, 35 percent were neglected, and 24 percent had been sexually abused (9).

Gender Differences in Adolescent Maltreatment

Some gender differences are evident in the data on adolescent maltreatment. Females appear to be more likely to be abused as they pass through adolescence than in childhood, while risk for males peaks early and generally declines through adolescence. The study of the national incidence and severity of child abuse and neglect conducted by the National Center on Child Abuse and Neglect in 1975 identified two female adolescent maltreatment victims for every one male (73).

Small studies tend to confirm the finding that female adolescents are at greater risk for maltreatment than males, with the reported figures for females in their samples of maltreatment adolescents ranging from 55 percent (34) to 77 percent (62). Powers and Eckenrode's analysis of New York State data found that among 12- to 17-year-olds, females accounted for 65 percent of the physical

Table 3-2—Cases of Maltreatment per 1,000 Children/ Adolescents, 1979 and 1986[a]

Age	National Center on Child Abuse and Neglect, Survey, 1979	National Center on Child Abuse and Neglect, Survey, 1986
0-2	6	6
3-5	6	10
6-8	11	15
9-11	11	15
12-14	12	23
15-17	14	28

[a] Definitions for maltreatment were different in the two surveys. In the survey conducted in 1979-80 the definition of maltreatment was "demonstrable harm due to maltreatment." In 1986 the definition of maltreatment included instances where "a child's health or safety is seriously endangered."

SOURCE: J. Garbarino, "Adolescent Victims of Maltreatment," contract paper prepared for the Office of Technology Assessment, U.S. Congress, Washington, DC, April 1990.

abuse cases reported, 88 percent of the sexual abuse cases, and 54 percent of the neglect cases. A 1984 study by Pelcovitz and others, however, found that only 45 percent of the abused and neglected adolescent population studied were females (75).[24]

Perpetrators of Adolescent Maltreatment

Families at high risk for maltreatment of adolescents can be characterized in terms of family structure or family dynamics. These factors may not be independent, but there has been little research on family dynamics (e.g., authoritative v. other styles) in nontraditional families.

Family Structure—Considerable research demonstrated that families at high risk for maltreatment in adolescence often contain stepparents. A variety of analyses point to the stepparent-adolescent relationship as a very risky one (19,54) and studies of maltreatment discussed below tend to confirm this.

Libby and Bybee reported that 28 percent of the families in their study of adolescent maltreatment were stepfamilies, even though only 11 percent of all adolescents live in stepfamilies (60). Berdie and colleagues reported similar findings; 25 percent of their families were stepfamilies (8). Olson and Holmes analyzed the data from the National Center on Child Abuse and Neglect's 1979-80 study of the national incidence and severity of child abuse and neglect and concluded that 40 percent of the adolescent maltreatment cases occurred in families with a stepparent (73). Garbarino and his associates found that, among a sample of 10- to 16-year-old adolescents (from families containing two adults—not always married) whom professionals identified as "having problems," families at "high risk" for adolescent maltreatment were more likely to have a stepparent (35). Farber and Joseph reported that only 30 percent of their maltreated adolescents were living with both biological parents (25).

Obviously, these findings do not imply that the majority of stepfamilies are abusive or that intact birth families are nonabusive, but they do suggest the stepfamily as a possible risk factor in adolescent maltreatment.

Family Dynamics—Families characterized as being high risk for adolescent maltreatment reveal a general pattern of difficulty in relating as an interpersonal system (6). Such families are at high risk on the dimensions of adaptability, cohesion, support, discipline, and interparental conflict.

Pelcovitz and colleagues conducted a clinical analysis of 22 families in which adolescents were physically abused, classifying them either as families in which the onset of abuse was during childhood (8 families) or as families in which the onset of abuse was during adolescence (14 families) (75). The eight families with adolescents who were first physically abused in childhood (involving 14 adolescents) manifested intergenerational abuse, spousal abuse, and developmentally inappropriate demands (75)—all elements of what has been termed "the world of abnormal rearing" (41).

Pelcovitz and colleagues classified the 14 families with adolescents where physical abuse first occurred during adolescence (involving 19 adolescents) in one of two categories on the basis of multiple, independent clinical assessments—"authoritarian families" (7 families) and "overindulgent families" (7 families). The *authoritarian* families (as distinguished from the "authoritative" families discussed earlier) were characterized by paternalistic, harsh, rigid, domineering styles of childrearing (75). They were also characterized by denial by the parents of their feelings toward each other and about the family system. Incidents of abuse typically arose from a challenge by the adolescent (acting out or testing behavior) that was met with overwhelming force. The high priority placed upon control provided the foundation for high levels of force.

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[24] However, this study only involved 33 adolescents from 22 families, with ages ranging from 13 to 18. In 80 percent of the cases where girls were the victims of maltreatment, the abuse was attributed to dating or sexual exploration, while in all cases of maltreatment of boys, the abuse was associated with truancy or delinquent behavior. The investigators used the definition of "abuse" found in the New York State Family Court Act of 1976, which includes physical injury, risk of death or disfigurement, impairment of physical or emotional health, and impairment of a bodily organ. The record does not indicate if any of the maltreatment cases involved sexual abuse—the exclusion of which could be a source of sample bias.

In contrast, the *overindulgent* families were characterized by parental efforts to compensate for the emotional deprivation that they had experienced in their own childhood (12 of the 14 parents had lost one or both of their parents during childhood) (75). These families made few demands upon their children, set few limits, and desired a high level of emotional gratification from their children. But when the children reached adolescence and sought to form primary attachments outside the home or began to act impulsively in important social settings, the overindulgent parents also reacted with excessive force.

Garbarino and his colleagues have contrasted the family system of families judged to be abusive with that of families judged to be nonabusive (34). These researchers used FACES, a measure of family adaptability and cohesion, to assess overall family interactions. Abusive families were more likely to be scored as "chaotic" or "enmeshed." Nonabusive families tended to fall into the more normal "flexible" and "connected" ranges.[25] On a measure of interparental conflict, adolescents in the abusive families tended to rate their parents as evidencing more conflict. It is important to note, however, that the average difference masks the fact that some abusive families evidenced extremely high conflict while, consistent with the finding that abusive families were more likely to be "enmeshed," others evidenced extremely low conflict. In a 2-year followup, it appeared that some abusive families dealt with conflict by expelling the adolescent, while others simply suppressed all manifestations of conflict through a conspiracy of silence.

Poverty and Adolescent Maltreatment— Families at high-risk for destructive parent-adolescent relations are less heavily concentrated among families living in poverty than families at high risk for *child* maltreatment (34). The National Center on Child Abuse and Neglect's study of the national incidence and severity of child abuse and neglect conducted in the mid-1970s suggests that the big social class differences that characterize *child* maltreatment cases are attenuated in the case of adolescent maltreatment (94). Families in which adolescents were abused were half as likely to be poor (i.e., earning less than $7,000 per year in 1979 dollars) as families in which children were abused. Presumably, some of the observed attenuation of social class differences in adolescent maltreatment is attributable to the fact that parents of adolescent tend to be older, and thus earning higher wages (on average) than the parents of young children. The attenuation may also be due to the greater difficulties that some families have in dealing with adolescence than with early childhood.

Blum and Runyan reported, for example, that 42 percent of all confirmed cases of maltreatment in Minnesota involved adolescent victims (10). Minnesota is a State with relatively little of the extreme poverty that tends to be associated with maltreatment (particularly neglect) in early childhood, and has been a leader in promoting professional awareness of adolescent maltreatment. In contrast to the Minnesota study, Garbarino and Kostelny report an intensive study of maltreatment rates in inner city Chicago neighborhoods where poverty is a major problem and there is little leadership in dealing with adolescent maltreatment (32). This study revealed a different picture, but still supported previous findings of a relatively poor predictive association between poverty and adolescent maltreatment, at least relative to child maltreatment (see table 3-3). Garbarino and Gilliam also reported findings consistent with the National Center on Child Abuse and Neglect's study of the national incidence and severity of child abuse and neglect (31). In their work, they found that families with adolescent-onset cases of maltreatment were about half as likely to be poor as families with the child onset (and child maltreatment) cases.

Despite the finding that family income alone is not a powerful predictor of risk for adolescent maltreatment, some research does suggest that a *feeling* of deprivation and strained resources, often associated with larger family size, may play a role (102). In addition, other measures of social status not based on income yield contradictory results. Farber and Joseph report that their families were predomi-

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[25] A *chaotic* family is a family characterized by lack of structure. An *enmeshed* family is a family in which individuals are excessively dependent upon each other. A *flexible* family is one that is able to combine structure with responsiveness to situational conditions. A *connected* family is one that is able to have close relationships without finding them stifling.

Table 3-3—Incidence of Maltreatment Among Children/Adolescents in Two Poor Inner-City Areas of Chicago

	Cases per 100 children/adolescents					
	Physical abuse		Neglect		Sexual abuse	
Age	Area I[a]	Area II[b]	Area I[a]	Area II[b]	Area I[a]	Area II[b]
0-4	5.1	3.8	40.0	32.8	1.6	1.7
5-9	5.2	4.6	22.3	22.5	0.7	1.8
10-14	2.4	1.8	10.8	13.5	0.5	1.9
15-19	1.5	1.8	3.9	4.6	1.0	0.1

[a] Area I poverty rate = 51 percent.

[b] Area II poverty rate = 40 percent.

SOURCE: J. Garbarino and K. Kostelny, "Patterns and Trends in Reported Cases of Maltreatment and Infant Mortality in Chicago Community Areas," Erikson Institute, Chicago, IL, 1989.

nantly lower class, while Pelcovitz and his colleagues report that 59 percent of their families were classified in the top two socioeconomic groups on a five-point measurement known as the Hollingshead Index (25,75). Only 12 percent of Libby and Bybee's families were categorized among the lowest socioeconomic groups, while Garbarino's research team found differences on the Hollingshead Index of socioeconomic status among abusive and nonabusive families (35,60). Berdie and colleagues reported that about 51 percent of the families in her study of maltreated adolescents earned less than $15,000 at a time when approximately 20 percent of all families did so (8).

Genesis of Adolescent Maltreatment: When Does It Begin?

Two theories dominate current thinking about the origins of adolescent maltreatment. The first holds that parents establish patterns of child abuse and simply continue such behavior through their child's adolescence. The second avers that much adolescent maltreatment occurs independently of earlier childhood abuse and may reflect the inability of a previously functional family to adapt to the new challenges of adolescence (28). The existing body of research on this question suggests that both theories account for a portion of the adolescent maltreatment population, but that there is a distinctly adolescent genesis to a significant number of cases—ranging from a high estimate of 90 percent to a low of 24 percent (8,9,25,31,60,62,75).

Sexual abuse may represent a special case, since studies suggest that sexual abuse begins in childhood, before the onset of adolescence. Kendall-Tackett and Simon interviewed 365 adults who were victims of childhood sexual abuse and found that the average age of onset was reported to be 7.5 years, with less than 10 percent having an onset after 12 years of age (57). In over half of the cases, the sexual abuse did not continue past the age of 12. This study offers an intriguing opportunity for further research to identify factors related to the ages of the victim and perpetrator which may be associated with both the onset and the cessation of sexual abuse within families.

Effects of Adolescent Maltreatment

Adolescents who are maltreated seldom die from the maltreatment. The fatality rate declines with age—from 0.09 per 100 0- to 2-year-old children to less than 0.01 per 1,000 adolescents. As Garbarino notes, however, some adolescent deaths may be indirectly attributable to maltreatment:

> A full accounting of the adolescent fatalities attributable to maltreatment could reasonably include numerous suicides and other self-destructive behavior appropriately linked dynamically and developmentally to the experience of maltreatment. For example, a runaway who leaves home to escape abuse and then falls prey to AIDS, or is murdered, or becomes suicidal on the streets is, in a very real sense, an "adolescent maltreatment fatality" (29).

Berdie and her colleagues report that 49 percent of their adolescent maltreatment victims exhibited significant clinical indicators of depression (8). Between 45 and 70 percent of the adolescents showed problems such as nervous habits, isolation, poor social skills with peers, lethargy, low self-esteem, low frustration tolerance, temper outbursts, and stubbornness.

Running away from home is directly correlated with maltreatment.[26] Approximately 73 percent of adolescent female runaways and 38 percent of the male runaways in one recent study reported that they ran away to avoid further sexual abuse (65).

Who Investigates Adolescent Maltreatment Cases?

The study of the national incidence and severity of child abuse and neglect conducted by the National Center on Child Abuse and Neglect concluded that "the child's age may be a major determinant of whether or not a recognized maltreatment problem is reported to CPS [children's protective services] for investigation and treatment" (95). The bulk of adolescent maltreatment cases are reported to and handled by agencies other than children's protective services. Thus, intervention models designed from study findings that rely on data from children's protective services and hospital samples may not be generalizable across the full range of adolescent maltreatment cases.

One reason that adolescent maltreatment is so often investigated by agencies other than children's protective services is that it is often viewed as a consequence of "acting-out" behavior by the adolescent or dysfunction within the family; and agencies such as community mental health centers or family services may be called upon to provide assistance.

Adolescents in the Child Welfare System

For children and adolescents who—for reasons of parental abuse and neglect, findings of delinquency, or other causes—are unable to live in an acceptable home environment with their parents, an elaborate child welfare system has been developed throughout the Nation.[27] This system includes the foster care system, a network of public and private institutions and agencies intended to provide substitute out-of-home care for dependent youth. Primarily regulated by the States, the child welfare system is backed up by juvenile and family courts.

While child welfare programs have their historic roots in orphanages and institutions, today the emphasis is largely upon community-based care, provided by surrogate families under professional supervision by public entities (23).[28] Two-thirds of all children in foster care are placed in families; the remainder are sent to institutions, including detention centers, mental hospitals, and special schools—often because no suitable family homes can be found (108). Foster care is designed as temporary placement until a child or adolescent can be returned to his or her family or pending completion of necessary treatment and rehabilitation.

Unfortunately, the reality has fallen short of the promise of foster care. The criteria for removal of children from their homes tend to be vague and subjective, and studies have confirmed significant differences in the handling of cases by caseworkers and judges (58,68). Nonwhites and Hispanics are placed out-of-home more frequently than other children (108). But worst of all, the "system" has tended to "lose" children and adolescents, in the sense that temporary out-of-home placements have resulted in permanent failures to reintegrate clients back into their homes.[29] In 1984, the average foster care stay was about 17 months (108). Tragically, children who remain in care longer than 18 months are seldom ever returned to their parents (58,68).

The 1990 Family Impact Seminar notes that a recent study of 500 adolescents/young adults who received care from the Casey Family Program indicates that the more placements they had, the more difficulties they encountered later in life (23). Between 20 and 30 percent of those evaluated had serious difficulties. In addition, a significant number of children in foster care were exposed to physical and sexual abuse from foster parents (24). A 1988 study by the William T. Grant Foundation's Commission on Work, Family, and Citizenship found that older adolescents average four different placements and at least one runaway episode while in foster care (108).

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[26] For a discussion of the health and other needs of homeless and runaway adolescents, see ch. 14, "Homelessness: Prevention and Services," in this volume.

[27] *Child welfare services* include adoption, child protection, foster care and centers, independent living programs, drop-in centers, sexual abuse and prevention programs, victim assistance programs, adolescent pregnancy programs, and shelters for runaway children and adolescents. Frequently, programs are operated by private nonprofit entities under grants or contracts with governmental agencies.

[28] In 1982, 76 percent of children in foster care were in family or group homes, and only 16 percent were in institutions. Group homes are the fastest growing form of care, yet they accounted for only 7 percent of out-of-home placements in 1982—mostly for adolescents.

[29] There are clearly instances when an adolescent's welfare requires continued out-of-home placement. But even though the return of some adolescents to the home environment may not always be desirable, the adolescents who are considered "lost" in the child welfare system do not return for other reasons (e.g., because family reintegration efforts are nonexistent, superficially conducted, or easily abandoned in poorly monitored programs).

There has in general been increasing recognition that the child welfare and foster care systems are not functioning well. In a recent article in the journal *Child Welfare*, Woolf noted that:

> A review of foster care history reflects a perpetual march down a road of good intentions with the failure to check the quality of the road, and, indeed, whether the interim goals to be accomplished along the way coincide with those of the final destination. . .The time has come to integrate good intentions and optimism with wisdom in the development of child welfare strategies for foster care. Cooperation, teamwork, and self-discipline between professionals and organizations is imperative to the development, implementation, and monitoring of a systematic treatment approach to foster care services (108a).

A 1989 National Health Policy Forum workshop referred to the child welfare system as "a crisis intervention system in crisis" (58a). In their issue brief for the National Health Policy Forum workshop, Koppelman and Jones noted the emerging health and social problems that burden a child welfare system; in turn, the child welfare system is fraught with case overloads and personnel shortages (58a). Personnel shortages include a shortage of foster parents (58a).

Although they are indicative of the problems faced by the child welfare system, it is important to note that recent commentaries have not focused specifically on adolescents in the child welfare and foster care systems.

Recognition of the problems associated with foster care has led to increasing emphasis on preserving families and reuniting children with their natural parents. Between 1977 and 1983, the number of out-of-home placements for children of all ages declined from 502,000 to 272,000 (108). Apparently aiding this trend was passage of the 1980 Federal Adoption Assistance and Child Welfare Act (Public Law 96-272).[30] In addition to requring child welfare agencies to make "reasonable efforts" to maintain a child or adolescent in the home prior to placing him or her in foster care, this act funded family preservation demonstration programs and research. Nonetheless, between 1984 and 1985, 31 States reported an increase in foster care placements (108). In 1985, there were 270,000 children in foster care, and about 45 percent of these (121,000 children) were between the ages of 13 and 18.[31]

In an effort to reduce out-of-home placements, State and local governments have experimented with innovative family preservation programs in which adolescents are viewed as an integral part of their family system.[32] These programs seek to assess and treat families as units (23). The family is seen as a part of the community in a broad ecological context. Services provided to families are generally oriented to specific and limited goals, which are jointly defined by the family and a program worker, in accordance with the expressed needs of the family. Such services may include parent education and skills training, referral to other services, family therapy, and individual psychological support and counseling. Family preservation programs attempt to draw on the strengths of families, with a caseworker acting as a catalyst and enabler.

Among the widely replicated models of family preservation programs are the following:

- the *Homebuilders* model, a crisis intervention model, which provides intensive services to families over 4 to 8 weeks, based on the assumption that the placement crisis presents a "window of opportunity," when parents are most likely to be able to learn and change;
- the *FAMILIES* model, a home-based services model, which is adapted to rural areas and widely used in Iowa, where it had its beginnings; and
- the *Oregon Intensive Family Preservation Services* model, which unlike the other two places primary emphasis on family therapy rather than on the provision of concrete services (23).

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[30] In a 1989 report, the U.S. General Accounting Office made the point that in the absence of national evaluations or comprehensive information systems, they could not determine whether or to what extent the Public Law 96-272 reforms were responsible for reducing the number of unnecessary out-of-home placements.

[31] In the preceding year, about 180,000 children entered foster care and an equal number left it (108).

[32] The Family Impact Seminar has identified programs in California, Colorado, Connecticut, Delaware, Florida, Illinois, Iowa, Kentucky, Maryland, Michigan, Minnesota, Missouri, New Jersey, New Mexico, New York, North Dakota, Oregon, Pennsylvania, Tennessee, Texas, and Washington (23).

According to a review for the Family Impact Seminar,[33] the Oregon Intensive Family Preservation Services model emphasizing family therapy has the highest success rate (87.3 percent, measured at termination of service) in terms of preventing out-of-home placement of children and adolescents, but the other two models have nearly as good success rates (81.4 percent for the crisis intervention model and 79.6 percent for the home-based services model) (23).[34]

Implicit in family preservation strategies is the assumption that it is better for a child or adolescent to remain with his or her family than to be taken out of the home and placed in foster care. It is important to note, however, that there may well be circumstances when preservation of the family is not in the best interests of the child or adolescent. For some, like the runaway and homeless adolescents studied by Shane, there isn't always a home to which they can return (83).[35] For others, the home environment is irretrievably hostile and destructive. Thus, reduction in out-of-home placements should not be the sole criterion for program success or public policy. Future evaluations of family preservation services should develop broader measurements of effectiveness and clearer definitions of outcome expectations.

Finally, Woolf notes that the family preservation policy mandated by Public Law 96-272 has meant that only the severest cases are remanded to foster care (108a). The implication has been that foster care has had to become more treatment-oriented, although, according to Woolf, it is not nearly treatment- or family-oriented enough (108a). A true treatment- and family-orientation would place foster care in a continuum of services for children and families, in which "the entry of a family into the foster care system should be accompanied by a diagnostic component to assess specified areas such as family system dysfunction, placement requirements for the child, and recommendations for treatment of family members" (108a). Such an initial assessment would be the first component in determining the treatment services needed to assist the family in becoming a healthier, functioning system (108a). Additional research on attitudes and skills needed by parents of adolescents (e.g., 5,6,86) may help to keep adolescents in their homes or improve the foster care system for adolescents.

Conclusions and Policy Implications

Adolescents do not grow up in a vacuum. Both their health and their development are influenced by myriad social and environmental interactions from the immediate (e.g., daily contact with peers, parents, and teachers or physical contact with poison ivy) to the global (e.g., changes in the ozone layer). The family's significance in this constellation of influences, if not preeminent, is at least major—for it touches the lives of most adolescents on a daily and deeply personal basis. Because parents usually have continuing proximity and can exercise some degree of power over the actions of adolescent family members, they are centrally important to any configuration of social factors shaping adolescent health. From time to time, peers and community may loom larger or smaller among an adolescent's external influences, but the family and parents will remain as constant elements despite fluctuations in their relative importance.

Given their ongoing role, if parents and families are to be a positive influence, they need to have accurate and useful information about adolescent development. Using parenting strategies with adolescents that were successful with children may generate conflict that could be avoided through alternative approaches to resolving differences.

Research (as documented through this Report) has suggested that the enhancement of parenting skills can improve the quality of life within families and reduce conflict, but studies of the effectiveness of

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[33] The Family Impact Seminar is an activity of the American Association for Marriage and Family Therapy Research and Education Foundation; Family Impact Seminar meetings provide information to public policy staff (23).

[34] The Family Impact Seminar notes that these comparisons are hampered by methodological concerns but suggests that the Oregon Intensive Family Preservation Services model emphasizing therapy seems best adapted to families with *adolescents* at risk of placement. At an average cost of $1,000 per family, the Intensive Family Preservation Services model also appears to be the least expensive (the average cost of Homebuilders is $2,600 per family and that of FAMILIES is $2,000). The reader is cautioned, however, that these cost figures, in the absence of experimental designs, do not provide a reliable basis for estimating cost savings over placement services.

[35] While "runaway" adolescents usually leave their homes voluntarily and without parental permission, sometimes parents or guardians encourage them to leave, abandon them, or force them out of their residence. The parents or guardians of these "pushout" or "throwaway" adolescents may resist family preservation services and deny an adolescent reintegration into the family. For a general discussion of homeless and runaway adolescents, see ch. 14, "Homelessness: Prevention and Services," in this volume.

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parenting programs on improving parent-adolescent relations and reducing specific problems of adolescence remain inconclusive (83a).[36] Still, the evidence suggests that authoritative parenting skills should be encouraged and information and training about this family model more widely disseminated.

A variety of public and private supports could help to relieve families in distress. Respite care to relieve family caregivers, family and parental leave, comprehensive (or at least catastrophic) insurance coverage, and increased access to family therapy and parenting education programs all merit serious consideration for development or expansion.

Policy aimed at reducing adolescent maltreatment should be a high priority. First, however, more analysis is needed concerning the definition and causes of adolescent maltreatment. Much of the research, policy, and programs on the causes, prevention, and treatment of maltreatment has not been specific as to the age of the child victim or has focused on younger children.

Additional research on a range of other issues and aspects related to families and adolescent health would be useful. Research on the effect of parenting styles on adolescent health and development in nontraditional families (e.g., stepfamilies and single-parent families) and ethnic and racial minority families, for example, is sparse (42,43,45,85). It would be useful if additional research emphasis were given to examining effective, well-functioning families and their impact on adolescent health rather than maintaining the traditional focus of research on family dysfunction and pathology. Knowledge of family influences that work to enhance adolescent health and development is as important as an examination of negative family influences. To assist researchers, improvements in the collection and reporting of data about intrafamilial maltreatment and family caregiving are desirable.

Perhaps most importantly, though, parents need to be viewed with respect and treated with dignity in their interactions with public and private agencies. The institutions of society—religious, social, and political institutions and the media—should recognize the diversity of America's families and the family's potentially significant role in improving the health of our Nation's children and adolescents. Rather than adhering to the outdated notion that parents are solely the obstacles to treatment for children and adolescents, many more professional health/mental health care providers should try to regard parents and other family members as partners—together with the practitioner and the patient—in the prevention, treatment, and rehabilitation of adolescent health problems (73a). While some families surely bear culpability for the health problems of their members, a "blame the family" or "blame the parents" approach to understanding the problems of adolescent health obfuscates more than it illuminates. Through strengthening the many positive contributions of families and parents to adolescent health, a more balanced and constructive perspective can be maintained.

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[36] For further discussion, see ch. 9, "AIDS and Other Sexually Transmitted Diseases: Prevention and Services," ch. 10, "Pregnancy and Parenting: Prevention and Services," and ch. 13, "Delinquency: Prevention and Services," in this volume.

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Chapter 4

SCHOOLS AND DISCRETIONARY TIME

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Chapter 4

SCHOOLS AND DISCRETIONARY TIME

Introduction

Every day, some 26 million U.S. adolescents ages 10 through 18 go to school. How do school environments affect adolescents' health—that is, their physical, social, and behavioral development and well-being? The role of schools in adolescent health is the subject of increasing debate (e.g., 27,147,210). School personnel often think that adolescents bring their health problems to the schools and regard efforts to address specific problems and generally improve adolescent health as the responsibilities of adolescents themselves, their parents, the health care system, and perhaps other institutions in the community (107b). The view that adolescents bring a considerable number of health problems with them to the school building each day is certainly supported by clinical evidence, but there is also evidence that schools play a role in exacerbating or ameliorating adolescents' health problems, broadly defined.[1]

As discussed elsewhere in this Report, some schools offer health education, fitness activities, and lunch or other meals to students, and some schools provide health care services through school nurses or school-linked health centers (SLHCs).[2] Some school buildings, are located in unsafe neighborhoods and have deteriorating facilities with asbestos, lead paint, radon, or other problems with potential implications for the health of their adolescent students, but these risks will not be addressed in this chapter. The question addressed in the first half of this chapter is how school academic and social environments affect U.S. adolescents' health. As discussed further below, particular aspects of school academic and social environments have been correlated with indicators of school adaptation (e.g., school grades, attendance, educational attainment, being retained in grade, and school dropout[3]), and some of these indicators have been correlated with adolescent health outcomes (e.g., self esteem, substance use, adolescent pregnancy and childbearing, and delinquency). Some major Federal policies and programs related to the education of adolescents are also discussed.

U.S. adolescents attending school spend some of their time every day away from school. It is virtually certain that the physical, social, and behavioral development of adolescents is shaped, at least in part, by the experiences that occur during their discretionary time (i.e., time that is not spent at school or in essential maintenance activities such as eating or sleeping). The second half of this chapter is devoted to an examination of adolescents' discre-

Photo credit: Bruce Clark/Education Week

Each day, some 26 million U.S. adolescents go to school, but the role of school environments in promoting adolescent health, whether discretely or through academic achievement, only recently seems to have emerged as a concern.

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[1] As noted in Vol. I of this Report and in ch. 2, "What Is Adolescent Health?" in this volume, a broad definition of health—including physical, social, and mental aspects and emphasizing a sense of well-being in addition to the absence of problems—fits the period of adolescence better than a narrow definition emphasizing the absence of physical health problems. In considering adolescent health, one should take into account traditional measures of physical health, newer behavioral measures, and a broad range of indicators of optimal functional status (including emotional and social status, perceived quality of life). A fully realized view of adolescent health should also be sensitive to the developmental changes that occur during adolescence.

[2] Nutrition and fitness activities in schools are discussed in ch. 7, "Nutrition and Fitness Problems: Prevention and Services," in this volume. Information about SLHCs is presented in ch. 15, "Major Issues Pertaining to the Delivery of Primary and Comprehensive Health Services to Adolescents," in Vol. III.

[3] Although "school dropout" is awkward terminology, this is such a common term in the field that OTA is using it. School dropout can be measured in various ways. In the U.S. Department of Education's report *Dropout Rates in the United States: 1988*, distinctions are made among *event dropout rates* (the proportion of students who drop out in a single year), *status dropout rates* (the proportion of the population that has dropped out at a given point in time), and *cohort dropout rates* (the proportion of a group of students that drop out over time) (202b).

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tionary time. It discusses available research on how adolescents spend their time and describes issues related to the development of health-enhancing alternatives, including the National and Community Service Act of 1990 (Public Law 101-610). The chapter ends with conclusions and policy implications.

School Influences on Adolescent Health[4]

Evidence that allows inferences about causal relationships between school environments and adolescent health outcomes such as substance abuse, pregnancy, delinquency, or victimization to be made with confidence is limited. The reason is that schools are seldom considered as factors in discussions of ways to improve adolescent health, and most of the research that has been done in this area shows correlational relationships rather than causal relationships. Another problem is that school and nonschool factors (e.g., individual factors, family factors, neighborhood factors) interact with each other in complex ways that have yet to be fully understood. When considering how school environments affect the health, behavior, and well-being of 10- to 18-year-old students, it is important to keep these caveats in mind.

The bulk of the discussion below details available evidence for the effects of different aspects of school environments—academic policies, school size, school decisionmaking and other processes, timing of school transitions, and classroom size, teachers' attitudes and behavior, school policies regarding cultural diversity, and parental involvement in schools—on adolescent health. First, however, overview of the U.S. educational system, with descriptions of Federal, State, and local funding responsibilities, and student enrollment statistics, is presented as background in the first section below. Major Federal programs related to education are discussed briefly after the discussion of evidence on the effects of school environments on adolescent health.

Overview of the U.S. Educational System for Adolescents

Figure 4-1 provides an overview of the structure of elementary and secondary education in the United States. Students usually spend 6 to 8 years in the elementary grades and then go on to a 4- to 6-year program in high school. They normally complete the entire program through grade 12 by age 17 or 18 (204).

Ten-year-olds typically enter grade 5, 11-year-olds grade 6, 12-year-olds grade 7, 13-year-olds grade 8, 14-year-olds grade 9, 15-year-olds grade 10, 16- year-olds grade 11, and 17-year-olds grade 12. In 1987, adolescents ages 10 to 18 totalled an estimated 26.4 million students (13.2 million in elementary school and 13.2 million in secondary school) (204).[5] From 1971 to 1984, enrollment in U.S. elementary and secondary schools steadily declined, but a new wave of secondary school students is expected in the years ahead (204).

U.S. schools are affected by funding, policies, and regulations at various levels of government, but public education is primarily a State and local responsibility. States establish State educational policies and determine how State monies are allocated. Generally, the States delegate operational responsibility for schools to local school boards. Some 15,000 local school boards set most policy for over 100,000 individual elementary and secondary schools in the United States (202).

The Federal Government supports elementary and secondary education through financial aid programs that include the Chapter 1 program discussed later in this chapter. In fiscal year 1989, the appropriation for Chapter 1 was $4.6 billion (202a). Federal spending for education is a small percentage of overall spending for elementary and secondary education. At its highest point in 1979-80, Federal spending accounted for 9.8 percent of total expenditures. In 1985-86, the Federal Government contributed only 6.7 percent of total revenues, with the States picking up nearly half of the expenses (49.4

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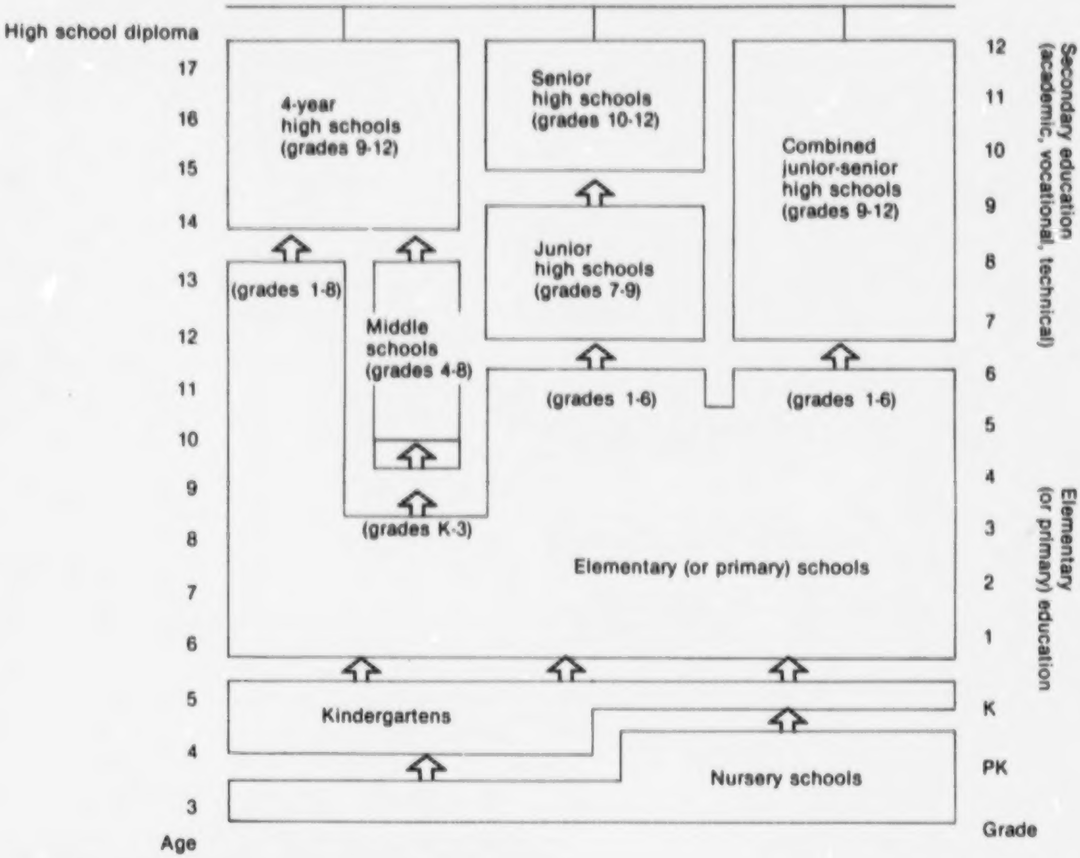
[4] This section draws substantially from a paper prepared under contract to OTA by Michelle Fine entitled "Middle and Secondary School Environments as They Affect Adolescent Well-Being" (72a).

[5] As noted in ch. 18, "Issues in the Delivery of Services to Selected Groups of Adolescents," in Vol. III, adolescents ages 10 through 18 numbered about 31 million in 1987. About 22.01 million (71 percent) are white, non-Hispanic adolescents; about 4.65 million (15 percent) black, non-Hispanic adolescents; about 3.1 million (10 percent) are Hispanic adolescents; and 1.24 million (4 percent) are "other" (including Asian) adolescents. The percentage of U.S. adolescents who are not "white, non-Hispanic" is growing, and this trend can be expected to continue into the foreseeable future. Racial and ethnic minority adolescents disproportionately live in poor or near-poor families.

Figure 4-1—Typical Patterns of Progression From Elementary School Through High School[a]



High school diploma
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
Age
4-year high schools (grades 9-12)
Senior high schools (grades 10-12)
Combined junior-senior high schools (grades 9-12)
Junior high schools (grades 7-9)
(grades 1-8)
Middle schools (grades 4-8)
(grades 1-6)
(grades 1-6)
(grades K-3)
Elementary (or primary) schools
Kindergartens
Nursery schools
12
11
10
9
8
7
6
5
4
3
2
1
K
PK
Grade
Secondary education (academic, vocational, technical)
Elementary (or primary) education

[a]Chart reflects typical patterns of progression rather than all possible variations.

SOURCE: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics, *Digest of Education Statistics, 1989* (Washington, DC: U.S. Government Printing Office, 1989).

percent) and local sources picking up the rest (43.9 percent) (72a). Schools have grown increasingly dependent on local tax bases and other resources (94).[6]

The proportion of U.S. students who graduate from high school has increased dramatically in the last century. In 1989, the graduation rate (defined as the percentage of 9th graders in 1985 who have been graduated in 1989) was calculated to be 71.2 percent (204b). Despite the improvements, dropping out of school is a serious problem in this country. Each year, more than 425,000 students in grades 10 through 12 drop out of school; others leave before reaching high school (202b). As of October 1989, the status dropout rate among 16- to 24-year-olds—i.e., the percentage of 16- to 24-year-olds reporting themselves to be dropouts—was 12.6 percent (204a). This means that about 4 million 16- to 24-year-olds in October 1989 were without a high school diploma or certificate and were not attending school.[7] Dropout rates for blacks, Hispanics, and Native Americans are higher than aggregate rates for the U.S. population (202b) (see figure 4-2).

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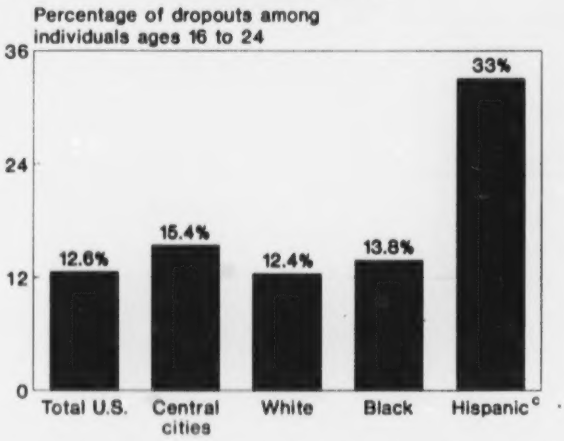
[6] Legal challenges brought in several States (e.g., New Jersey, Texas, Montana, and Kentucky) have recently resulted in court decisions striking down school financing systems because of disparities between spending in poor and wealthy school districts (107a). Similar challenges can be expected in the future.

[7] Some high school dropouts eventually earn a high school degree, either by returning to school or by passing the tests of general educational development (GED).

Relationships Between Adolescent Health and School Adaptation

In the course of this assessment, OTA found that school environments, academic achievement and failure, and adolescent health are typically viewed as discrete entities. If relationships between academic achievement and failure and adolescent health are considered, it is the impact of health problems on academic achievement that is discussed, not the reverse (e.g., 108a). The role of school environments in promoting or impeding academic *achievement* has been controversial (32a,103a,178). The role of school environments in promoting adolescent *health*, whether discretely or through academic achievement, appears to be a recent concern and one not yet fully recognized by many professional educators (27,107b,147). This section reviews research that suggests that, just as adolescent health problems can affect school adaptation,[8] some indicators of school achievement have been found to affect adolescents' health, well-being, and ultimately, their long-term economic productivity. After briefly addressing measures of school adaptation, the next section reviews evidence for the impact of aspects of school social environments and policies on school adaptation and on adolescent achievement and health. It is important to note that OTA knows of no single study that has tracked in a systematic way the impacts of school environments on school adaptation and health, and the feedback loops that must occur among these elements (see figure 4-3). It is difficult, of course, to disentangle the effects of the academic achievement and health of students attending a school from other aspects of the school environment.[9] Thus, tentative inferences must be drawn about many of the relationships among school processes and adolescent outcomes.

Figure 4-2—High School Dropout Rates in the United States, 1989[a] [b]



[a]Dropout rates shown in this figure are status dropout rates (the proportion of individuals of a specified age who are not enrolled in school and have not finished high school at any given point in time) among individuals ages 16 to 24 as of October 1989.

[b]The data on which this figure is based are Current Population Survey data from the U.S. Department of Commerce, Bureau of the Census.

[c]Hispanics may be of any race.

SOURCE: Office of Technology Assessment, 1991, based on U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics, *Dropout Rates in the United States*, NCES 90-659 (Washington, DC: September 1990).

Students' adaptation to school can be measured using a variety of indicators. Short-term indicators of school adaptation include school attendance, school grades, participation in extracurricular activities, and being retained in grade. Short-term indicators of school adaptation are sometimes predictive of school dropout. One highly predictive short-term indicator is retention in grade (70,112). After social class controlled for ability, being retained in grade (and therefore being overage for that grade) is the best predictor of school dropout (68a).

As shown in table 4-1, studies have found that dropping out of school and other indicators of poor school adaptation are associated with adolescent health outcomes that include substance abuse, delinquency, and adolescent pregnancy and childbearing[10] (1,14,62,84a,85,137,210). Furthermore, the lack of a high school diploma seriously jeopardizes adolescents' future economic and social well-being (216). The consequences are particularly adverse for poor and minority students (14,81a,198). Having a

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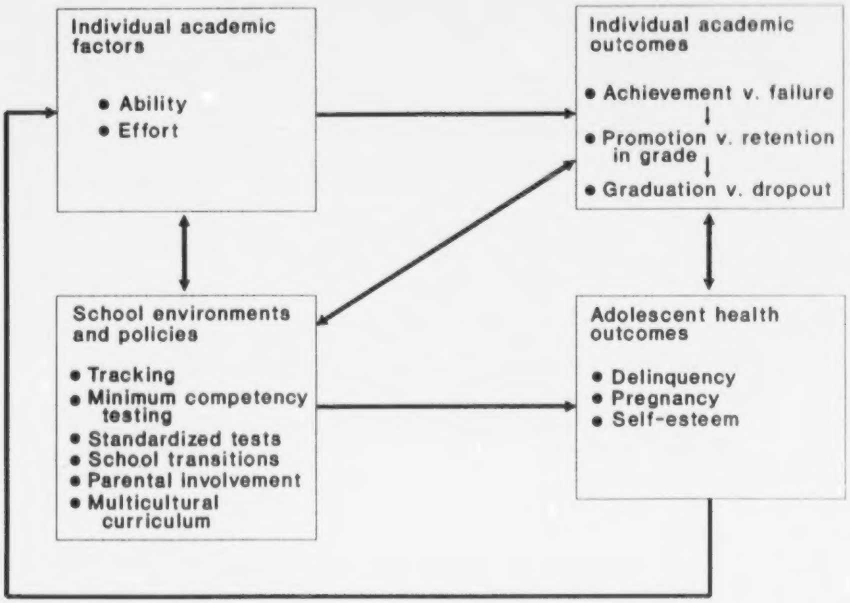
[8] For an analysis of adolescent school loss (i.e., absences) occurring as a result of illness, see ch. 6, "Chronic Physical Illnesses: Prevention and Services," in this volume.

[9] For example, a school in which many students are routinely absent, or hang around school but skip classes, or are violent in school, can have a deleterious impact on teachers and administrators (e.g., they may come to feel powerless and depressed), who in turn have an impact on the more well-behaved students. Environments such as these are commonly observed but have rarely been systematically researched (72a).

[10] The relationship between school dropout and adolescent pregnancy and school dropout is complex. For further discussion, see ch. 10, "Adolescent Pregnancy and Parenting: Prevention and Services," in this volume.

Figure 4-3—Possible Relationships Among School Environments, School Adaptation, and Adolescent Health


Individual academic factors
• Ability
• Effort
Individual academic outcomes
• Achievement v. failure
• Promotion v. retention in grade
• Graduation v. dropout
School environments and policies
• Tracking
• Minimum competency testing
• Standardized tests
• School transitions
• Parental involvement
• Multicultural curriculum
Adolescent health outcomes
• Delinquency
• Pregnancy
• Self-esteem

SOURCE: Office of Technology Assessment, 1991.

high school diploma, even with a poor achievement record, significantly improves labor market participation (216), although poor achievement may have other negative consequences (84a,137). High school dropouts are more likely to be unemployed or underemployed than high school graduates and are half as likely to hold white collar jobs as high school graduates are (216). Because they are less likely to be employed or to have jobs with good career prospects, high school dropouts are more likely to be poor and to experience the health and other disadvantages associated with poverty (e.g., substandard living conditions, poor nutrition, diminished access to health care services). Their children are also likely to experience disadvantage.[11] For society as well as dropouts, dropping out of school has high costs. The societal costs include not only lost productivity and increased social welfare costs but more intangible costs associated with poverty and lack of education among certain segments of society.

According to some observers, high dropout rates and high rates of retention in grade are one indication of the failure of schools to meet their students' educational or social growth needs (81a). This failure seems particularly apparent in schools serving largely poor, racial, and ethnic minority adolescents, and adolescents in central cities. Unfortunately, dropout rates are typically reported by population groupings based on race, and not by school or community. Reporting measures of school adaptation in this way makes it difficult to disentangle school environment effects on dropout and retention in grade from the influence of other factors (e.g., family economic need). National data suggest that socioeconomic status and race/ethnicity are related to students' school adaptation, as measured in terms of retention in grade and school dropout (see table 4-2). An analysis of data from the High School and Beyond Survey using a composite family socioeconomic status index (including family income, parental education, and other factors) found

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[11] The health and other effects of growing up poor are complex and not fully understood. See ch. 18, "Issues in the Delivery of Services to Selected Groups of Adolescents," in Vol. III.

Table 4-1—Evidence for the Relationship Between School Adaptation and Adolescent Health

Study[a]	Indicator of school adaptation	Adolescent health
	Dropout	
Berlin and Sum, 1988 (High School and Beyond survey data)	School dropout.	Associated with adolescent pregnancy and parenting[b]; high rates of subsequent poverty and unemployment; skill deficits. Situation getting worse for blacks—in 1973, 14 percent of black male dropouts reported no earnings, as compared with 43 percent in 1984.
W.T. Grant Foundation, 1988 (national survey data)	Dropout rates.	Associated with higher rates of adolescent pregnancy.[b]
Young, 1983	Dropout status.	High school dropouts are far more likely to be underemployed or unemployed than high school graduates; employed dropouts are half as likely to hold white collar jobs as are high school graduates.
Hispanic Policy Development Project, 1989 (review of the literature)	Dropout and low-achieving graduates.	Decreased likelihood of enrolling in postsecondary education; increased levels of welfare receipt; higher unemployment rates.
	Lack of high school diploma and poor academic achievement.	Associated with early childbearing.[b]
Fagan and Pabon, 1988	Male dropouts.	Weak social attitudes, more drug problems, and more delinquency among dropouts than among high school graduates.[b] Male dropouts are far more likely to be involved in criminal behavior than their in-school peers.[c]
	Other indicators	
Garbarino and Asp, 1981	More years of school.	Positively associated with enhanced quality of child care offered to one's own children and with political competence; negatively associated with criminal activity.
Gottfredson, 1988	Poor school grades, limited educational attainment, special education placement, being retained in grade, poor attendance.	Associated with juvenile delinquency.[c]
McPartland, Colderon, and Braddock, 1987	Poor school grades.	Associated with school property violence.
Academy for Educational Development, 1989	Lower than average academic performance, school dropout.	Associated with adolescent pregnancy.[b]
Pallas, Natriello, and McDill, 1987	Participation in extracurricular activities.	Correlates, particularly for academically marginal students, with academic progress, heightened self-expectations, reduced frequency of delinquency, and increased persistence in schools.

[a] Full citations are listed at the end of this chapter.

[b] The relationship between school dropout and adolescent pregnancy is discussed in ch. 10, "Pregnancy and Parenting: Prevention and Services," in this volume.

[c] For a discussion of adolescent delinquency, see ch. 13, "Delinquency: Prevention and Services," in this volume.

SOURCE: Office of Technology Assessment, 1991.

Table 4-2—National Data on the Relationship of Students' Race/Ethnicity and Socioeconomic Status to School Adaptation

Study[a]	Adolescent health outcomes
Aspira, 1983 (cohort study)	New York City dropout rates exceed 68 percent for blacks and 80 percent for Hispanics.
Tobier, 1984 (survey of adults)	In 1985, 32 percent of New York City's white adults had fewer than 4 years of high school, as compared with 39 percent of blacks and 57 percent of Latinos.
National Assessment of Educational Progress, 1990 (large data set on the reading ability of students)	Students in general are better readers in the 1980s than they were in the 1970s, although no discernible changes occurred between 1984 and 1988; blacks and Hispanics made improvements during the period of 1971 to 1988—nearly all 13- and 17-year-olds can read basic material; however, the mean reading profile of black and Hispanic 17-year-olds remains only slightly better than white 13-year-olds.
U.S. Department of Education, 1987 (national survey data collected from schools)	In 1986, among 18- to 19-year-olds, 13 percent of white males, 11 percent of white females, 15 percent of black males, 15 percent of black females, 29 percent of Hispanic males, and 24 percent of Hispanic females were classified as dropouts.
Neckerman and Wilson, 1987 (U.S. Bureau of the Census data collected retrospectively as self-reports from adults)	National dropout rate is 27 percent; central city dropout rate is 42 percent; dropout rate in poverty areas in central cities is 54 percent. In poor neighborhoods—defined as over 50 percent living below the poverty line—dropout rates vary: in Anaheim, California, for instance, the dropout rate is 75 percent; in poor neighborhoods in Madison, Wisconsin, the dropout rate is 20 percent; in poor neighborhoods in New York City, the dropout rate is 58.5 percent.
Rumberger, 1987 (U.S. Department of Education national survey data from 1984)	In 1972, national dropout rate was 22.8 percent; in 1984, dropout rate was 29.1 percent; New York State dropout rate was 25.3 percent in 1972 and 37.8 percent in 1984; New York State estimates that 62 percent of Hispanics drop out, and 53 percent of blacks drop out.
Barrow and Kolstad, 1987 (High School and Beyond survey data)	The dropout rate among students from the lowest socioeconomic quartile is about 22 percent; the dropout rate among students from the highest socioeconomic quartile is about 7 percent. The relationships between socioeconomic variables and dropout rates often differ substantially between the sexes and among white, black, and Hispanic students.
Berla, Henderson, and Kerewsky, 1989 (review of the literature)	By age 15, 25 percent of all students have been held back once or more. By age 11, 44 percent of black males, 26 percent of black females, 38 percent of Latino males, and 32 percent of Latino females have repeated one grade.

[a] Full citations are listed at the end of this chapter.

SOURCE: Office of Technology Assessment, 1991.

that the dropout rate among students from the lowest socioeconomic quartile was about 22 percent, whereas the dropout rate among students from the highest socioeconomic quartile was about 7 percent (10a).

Blacks and especially Hispanics have considerably higher rates of retention in grade and school dropout rates than white non-Hispanic adolescents, especially in urban areas (7,175,198,203). As shown in table 4-2, Berla and colleagues report that by age 11, 44 percent of black males, 26 percent of black females, 38 percent of Latino males, and 32 percent of Latino females have repeated at least one grade (12). As noted above, 13.8 percent of black 16- to 24-year-olds, 33 percent of Hispanic 16- to 24-year-olds on average, and 15.4 percent of 16- to 24-year-olds living in central cities report not having a high school education (the so-called status dropout rate) (figure 4-2). It is notable that dropout rates in central cities are higher than in the United States as a whole, and dropout rates in cities with a high proportion of minorities are about one and a half times greater than the overall dropout rates (148).

Overview of the Effects of Specific Factors on School Environments and on Adolescent Health

The next several sections of this chapter examine evidence regarding the effects of the following factors on adolescent health:

- specific academic policies (e.g., use of minimum competency tests, use of other standardized tests, tracking of students by achievement levels),
- school size,
- school decisionmaking policies and orientation to punishment,
- arrangements for school transitions,
- class size,
- teacher behaviors,
- school policies regarding cultural diversity, and
- parental involvement in schools.

As discussed below, school *academic policies* that emphasize raising achievement levels through means such as standardized testing and school policies that implicitly or explicitly track students by achievement level may have some positive effects on high-achieving students but generally have been found to have detrimental effects on academically marginal, low-income or minority adolescents. Especially for low-income or minority students, school environments that emphasize these practices are likely to affect adolescent health by diminishing self-esteem, increasing psychological symptoms, and segregating adolescent friendships (89,188). These policies have been found to be associated with low levels of academic achievement and increased rates of retention in grade and school dropout among academically marginal low-income and minority students (84,89,110,117).

School size has often been found to be related to student attendance levels, levels of participation in extracurricular activities, and reported sense of responsibility (74,168). Large school size—e.g., more than 1,000 students—has been associated with adverse adolescent health outcomes, even when location (e.g., urban, rural) and social class or minority composition of the school is controlled for. These include increased rates of a range of behaviors including vandalism, drug selling, theft, and violence (74,137,203) and elevated rates of school expulsions, disciplinary transfers, and school suspensions, which are indicators of delinquency (127,133). Some studies have found larger schools to have higher rates of retention in grade and dropout (127,168). In contrast, some studies have found that school size has no effect on academic achievement (178), a measure of school adaptation that is related to health outcomes (table 4-2).

Some *school decisionmaking and other processes* have been associated with high dropout rates and delinquent behaviors (84,137,158,178). Adolescents in schools where students, teachers, and parents collaborate in school decisionmaking and other processes tend to have higher rates of attendance, fewer behavioral problems, and higher levels of academic achievement (84,137,178). Some studies have found that students in schools with a punitive orientation are more likely to be violent and express feelings of alienation (178).

The *timing and nature of transitions to different levels of schooling* also have been found to influence adolescent health. In general, school transitions that occur in the 7th and 10th grades seem to cause the most difficulties (18,22,169). Such transitions seem to have the most detrimental effects on females and may also negatively affect low-income students (11,18). During school transitions, some adolescents show diminished levels of self-esteem, school participation, and academic achievement (18,22,169). These effects are influenced by the number of teachers adolescents are exposed to and the size of their classes (22,151).

As discussed further below, the evidence on the effect of *class size* on student achievement is somewhat ambiguous. It does appear, however, that small classes are beneficial to academically marginal students.

Teachers are likely to be influential in mediating the effects of school environments on adolescent health and well-being. Of course, school environments are likely to have a large influence on *teachers' attitudes and behaviors*. For example, a school's orientation towards punishment, its decisionmaking strategies, the school's physical conditions, and work demands have been found to affect teachers (9,40,144). When teacher practices are substantially controlled by administrative decisions, teachers are more likely to have low levels of morale and job satisfaction, and high rates of absenteeism (9,40). In schools that emphasize shared decisionmaking, teachers have better attitudes about their students, higher levels of morale and satisfaction, and are more likely to successfully implement and maintain new practices (24,40,45,72,122,194). Teachers that use cooperative teaching strategies (e.g., team teaching) foster adolescent health through their effects on achievement, cross-racial friendships, and lower levels of delinquency (75,141,178). Working conditions and administrative policies that affect teachers' behaviors (e.g., absenteeism) and teachers' attitudes (e.g., morale, attitudes toward students) and evidence for the effects of teacher behaviors on adolescent health are discussed below.

School policies that ignore *racial and ethnic differences in their social arrangements and curriculum* may have adverse consequences for students' social development and academic achievement (72). It could be argued that minorities are forced to choose between their own culture and their academic and professional development when schools sensitivities, and resultant curricula and activities, do not reflect the cultural diversity of their members. In schools that lack a multicultural perspective, minority students are likely to develop negative attitudes about their ethnicity or oppositional cultural forms (e.g., consider "being smart" to be "acting white") (43,102,157a). Schools with bilingual programs have been found to enhance minority students' levels of academic achievement (43).

Finally, it appears that adolescent students' levels of achievement are enhanced by *parental expectations of achievement and parental presence in schools* (25,35,70,73,195).[12]

Evidence for the Effects of Specific Academic Policies on Adolescent Health

Among the school reforms of the 1980s were efforts to raise academic standards by increasing course requirements for graduation and by using standardized testing or minimum competency tests (MCTs). Another approach that some schools have used is separating students by achievement levels—also known as academic tracking.

Using Standardized Testing and Other Practices To Raise Academic Standards—Since 1980, 45 States and the District of Columbia have changed requirements for earning high school diplomas, primarily by increasing the course units required to graduate (166). The length of the school day has been changed (or changes have been recommended) in 13 States and the District of Columbia. And in 12 States, the teaching career ladders have been changed. Increases in requirements have been found to place additional responsibilities on teachers and lengthen the school day without additional support.

Available evidence suggests that such policies have had some adverse consequences, especially for academically at-risk students. Increased course requirements diminish time for participation in extracurricular activities, participation which particularly for marginal, poor and minority students, enhance academic progress and reduce delinquency. Pallas and colleagues found that an increase in course requirements was associated with increased alienation among marginal students who seem to be most attached to courses outside the core curriculum (164). Unfortunately, Pallas and colleagues noted, teachers in the schools where increased course requirements were required were seldom given the support they needed to reach academically marginal students. Raising standards was therefore an empty gesture, tending to push low-achieving students out of school.

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[12] For further discussion of parents' influence on adolescents' health, see ch. 3, "Parents and Families' Influence on Adolescent Health," in this volume.

Table 4-4 also suggests that the use of standardized testing and MCTs have adverse consequences for marginal students. One study found that standardized testing is practiced in larger schools where there are more marginal students and tends to result in curricula that conform to the test (138). Several studies have found that, although standardized testing has small positive effects on high-achieving students, students in schools where such testing is used are more likely to be retained in grade (84,138,185). Educators generally agree that promoting adolescents who are not ready to be promoted will not be beneficial to their health unless they receive additional support to learn the skills they lack (71), but many educators have voiced concerns that standardized testing has the capacity to further marginalize disadvantaged students (209,213).

Similar, yet more pronounced, are the effects of the recent national shift toward the widespread use of MCTs. In 1989, 24 States used MCTs for remediation, 12 for promotion, and 24 for graduation (91). According to Haney and Madaus, the recent national shift toward the use of MCTs has had profound and devasting consequences for students' academic performance (91). The use of MCTs has been linked to increased rates of retention in grade and school dropout in school districts that use MCTs (91). Some evidence suggests that dropout rates may be disproportionately high for at-risk (e.g., black and bilingual) adolescents (91,110). MCTs may also have adverse psychological consequences (e.g., apprehension, diminished self-esteem) for some students.

To sum up, school academic policies that emphasize raising achievement levels by increasing courses, using standardized testing, or using MCTs can adversely affect academically marginal students through increasing rates of retention in grade and increasing rates of school dropout.

Tracking Students by Achievement Levels—Policies used to track students by achievement level range from the use of selective criteria for entry into schools which parents can "choose" for their child, district-wide stratification of public high schools, heterogeneous course offerings, school intake policies, teacher-selected ability groupings, and differential access to school guidance counselors. Such policies may be developed and implemented by local school districts, by individual schools, by teachers within schools, or by guidance counselors. School districts that stratify their public schools and use selective criteria for entry into "choice" schools foster differential ability groupings across schools. Administrators who build in specialized courses, and who admit a homogeneous intellectual mix of students to schools are tracking within a school, whereas teachers who create student ability groupings are tracking within their classes. Finally, guidance counselors who devote more of their resources to counseling academically tracked students about educational and vocational options reinforce the existing system of tracking.

Schools that use student selection criteria typically receive a disproportionate share of district resources (211). Furthermore, national data suggest that schools that have a higher concentration of at-risk poor and minority students receive fewer resources for staffing and materials, and such schools have been found to rely more heavily on remedial and rote memory activities (143).

Tracking practices that skim the best students off the top and place them in selective schools may not only have adverse consequences for marginalized schools but may also minimize overall achievement records of entire school districts. In a longitudinal analysis of adolescents attending nonselective schools in London, Rutter and colleagues found that the intellectual heterogeneity of students was strongly associated with positive educational outcomes for the entire school (178). Rutter and colleagues concluded that schools need a substantial nucleus of average- to above-average-intellectual-ability students in order to achieve schoolwide. Other researchers, examining schools with good academic records, have found that most such schools restrict or reject tracking, reinforcing Rutter's conclusions that heterogeneous ability groupings enhance school achievement outcomes (79). Furthermore, schools where school composition is skewed towards marginal students have been found to have disproportionately high rates of dropout and low rates of achievement (211).

Tracking that occurs when teachers place students into "ability groupings" is sometimes rather arbitrary; criteria unrelated to the ability of students have been demonstrated to have effects on the placement of students into "ability groupings." According to Hallinan, for example, teachers often create a set number of equally sized groups that assume that student ability is equally distributed in their classroom (89). Students who are older when entering an elementary school are more likely to be placed in the highest ability groups, an observation suggesting that advantages resulting from age and previous experience play a role in determining ability groupings (89). Adolescents who are placed in low-ability groups have been found to fall behind academically, and students chosen for high-ability groups have been found to achieve more than their peers of equal ability who are not in high-ability groups (89). Placement in ability groupings also seems to exert an effect on adolescent friendships: students placed in ability groups are less likely to have crossracial and crossachievement friendships than students not placed in ability groups (89,188). Minority students may also come away from tracking with more negative attitudes towards their own ethnic group. For example, Iadicola examined the effects of tracking across schools and found that Hispanics, especially females, who attended schools with higher rates of testing and higher numbers of ability groupings were more likely to express negative attitudes toward their ethnicity (102). Ingrained social patterns of racial stratification seem to be reinforced by institutionalized tracking practices which only reinforce white students' preferences to bond with similar others.

Some studies have found that minority, poor, rural, and vocationally tracked students report that counselors do not play a significant role in their future goals, whereas academically tracked students report that they do (118,119). This situation may sometimes result from academically tracked students' greater initiative in contacting guidance counselors, but it may sometimes result from counselors' seeking a greater role in counseling academically tracked students. Evidence suggests that in some situations, guidance counseling is more directed to high-achieving students (118,119).

To sum up, tracking students by achievement level is inequitable because academically tracked students receive better instruction, easier access to counseling, heightened teacher expectations, better peer evaluations and more interesting curricular content than students in lower achievement groups (155). Since there is evidence that ability groups are sometimes based on arbitrary criteria (e.g., a student's entry into selective "choice" school may reflect the parents' ability to negotiate or may be determined in part by a student's age) and because the students in groups receive different school resources, it can be argued that ability groupings *create* differences in students' academic achievement levels rather than minimize them. Students marginalized by the tracking process achieve less and drop out more than students in matched schools that do not use tracking (155).

Available evidence suggests that a heterogeneous mix of intellectual ability is associated with high rates of overall school achievement. Thus, it can be argued that minimizing the intellectual mix of schools (i.e., tracking across schools) or offering specialized courses to high achieving students and remedial courses for low-achieving students (i.e., tracking within schools) may not responsibly serve the majority of adolescents. Policies that place students into homogeneous groupings may have detrimental effects on the majority of adolescents' academic achievement levels. Nonetheless, some observers have concluded that tracking persists because of fears about the effects of "untracked" schools on the best students (37).

Evidence for the Effects of School Size on Adolescent Health

In considering the differences between the effects of large and small schools on adolescent health, it is important to realize that size of school is confounded with variables that include location (i.e., rural v. urban), financing, and school-related processes. Large schools are typically in urban, often more socially disorganized, settings than small schools with a high density of low-income students. These schools often receive less money or receive money with restrictions on how it can be utilized (25). Large schools are also often associated with more administrative staff, more centralized decisionmaking processes, and fewer opportunities for teachers and students to participate in school policymaking (40,168). Furthermore, large schools have been found to have more rigid and compartmentalized roles, more complexity in their communication patterns, larger class sizes, more institutionalized tracking, and punitive and controlling disciplinary orientations (25,27,75,85,163,203). Finally, the students attending large schools may be different from students attending small schools. For example, more students attending large schools (i.e., minority, lower income, and poorer students) may confront problems with health, housing, language, welfare, and academic difficulties (24).

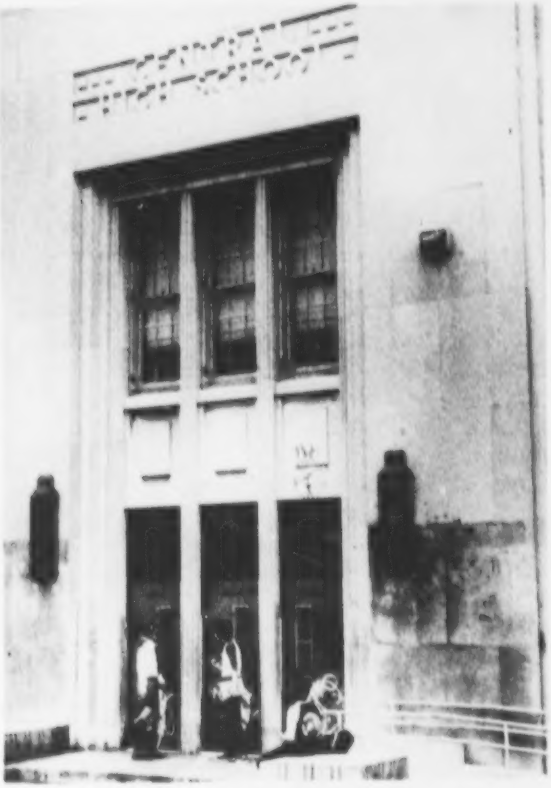

Photo credit: April Saul/Education Week

Many large urban schools serving socioeconomically disadvantaged students lack the combination of features that promotes adolescents' health and well-being.

A longitudinal study in England by Rutter and colleagues found no relationship between school size and students' academic achievement (178), but numerous other investigators have found correlations between large school and adverse academic and health outcomes, especially for marginal, poor, and minority students (27,74,75,118,130,162).

Large school size has been correlated with high levels of alienation among students and teachers (24,25), with high delinquency rates, high suspension rates, low attendance rates, and high dropout (27,133,137,168). Small schools have been found to have lower levels of vandalism, less anomie, and lower levels of victimization (74).

Although small schools seem to be beneficial for all students, they appear to be most beneficial for academically marginal low-income and minority students (27,75,130,162). School size seems to affect social cohesion, participation in school activities, sense of responsibility, and interactions with faculty (168). Small schools offer greater social cohesion and intimacy and Garbarino found marginal students to be four times more active in small schools than in large ones (74). Large schools tend to have more diverse curricula and more tracking, and such schools may tend to marginalize adolescents with relatively poor academic achievement records (see discussion above).

To sum up, small schools seem to be associated with better academic and health outcomes for adolescents than large schools. Furthermore, school size appears to differentially matter most to academically marginal low-income and minority students. Larger schools are associated with negative academic outcomes (i.e., increased rates of retention in grade and school dropout), as well as delinquency (i.e., higher rates of drug selling, theft, vandalism), behavioral problems (i.e., higher rates of expulsions, suspensions, and disciplinary transfers), and lower rates of participation in extracurricular activities and fewer interactions with faculty.

It may be that the health outcomes of adolescents attending schools of different sizes are particularly influenced by the impact that size of school has on shaping school-related processes. Possibly school size is only important because it shapes a wide array of school processes. If that is the case, simply changing the size of the school without attending to all of the associated factors (e.g., less funding, increased bureaucracy) would, in all likelihood, be futile. In the next section, the effects of school-related processes that have sometimes been associated with school size are examined for their impact on adolescent health.

Evidence for the Effects of School Decisionmaking and Other Processes on Adolescent Health

There is limited evidence regarding the relationship between school processes and adolescent health outcomes. Rutter and his colleagues were among the first investigators to systematically examine the relationship between processes that occur within schools and student outcome variables (178). They devised a composite school process measure which reflected the degree of emphasis on academic achievement, the extent to which courses were planned and taught by teams of teachers, the availability of incentives and rewards for student performance, and the degree of encouragement that adolescents were given to participate and take responsibility for themselves and for others. In a longitudinal study in England, Rutter and colleagues found that such processes improved adolescents' academic achievement and school attendance rates and minimized behavioral problems and delinquency.

Some investigators have examined the relationship between the decisionmaking process used by school administrators and school staff and adolescent health.[13] McPartland and colleagues found that schools where students participate in decisionmaking have lower rates of vandalism, and students report enhanced communication (137). Gottfredson and colleagues found that the schools where students, teachers, administrators, and parents have access to the decisionmaking process tend to have reduced rates of delinquency (84). Furthermore, schools that have poor teacher-administration cooperation and where teachers report lack of administrative soundness tend to have higher dropout and delinquency rates and more discipline problems (84).

Some investigators have found a relationship between a school's orientation towards punishment and adolescent health. They have found that schools that frequently use punishment and that focus on control tend to have high rates of school victimization and increased rates of disciplinary problems and that students who attend those schools often report feeling alienated (84,178). Optow has argued on theoretical grounds that schools that underreact to school-based violence (e.g., ignore) or overreact to school-based violence (e.g., inflict excessive punishment) make it difficult for adolescents to develop trusting relationships with adults from whom they can learn to control their aggressive impulses (158).

To sum up, available evidence suggests that some school processes—e.g., relying on team teaching efforts, encouraging students to participate in decisionmaking and relying more on rewards and positive incentives for student performance than on punishment—improve students' academic achievement, school attendance rates, and are associated with reduced rates of delinquency, dropout, school victimization, and reported alienation among students.

Evidence for the Effects of School Transitions on Adolescent Health

School transitions are changes from an elementary school to either junior high or middle school and changes from junior or middle school to high school. Figure 4-1 illustrates the common ways that school transitions have been organized in the United States. The most common school configuration is kindergarten through 6th grade (elementary school), 7th through 9th grade (junior high school), and 10th through 12th grade (high school) (204). Another common configuration is kindergarten through 8th grade, followed by 9th through 12th grade. Yet another common configuration is kindergarten through 4th grade, 5th through 8th grade (middle school), and 9th through 12th grade.

Whether looking at evidence of retention in grade, suspensions, schoolwide victimizations, or academic achievement, several studies suggest that seventh grade is often a difficult year, especially when it corresponds to the first year out of elementary school. In a 1988 analysis of Philadelphia's grade reorganization, Pugh compared seventh and eighth graders in junior high schools (schools configured grades 7 through 9) with seventh and eighth graders in middle schools (schools configured grades 5 through 8 or grades 6 through 8) (169). The seventh and eighth graders in junior high schools—i.e., students who underwent school transitions in the seventh grade—had substantially more suspensions (35 v. 23 percent) and retentions in grade (15 v. 8 percent), had lower rates of attendance, and on achievement tests adjusted for socioeconomic status scored 12.9 points lower than the seventh and eighth graders in middle schools did. The Pugh analysis is consistent with other analyses (72a).

Blyth and colleagues conducted a 5-year longitudinal study of 594 white adolescents from the 6th through 10th grades (1974-79) in 18 schools in Milwaukee (18). Some of the students attended schools configured kindergarten through grade 6, grades 7 through 9, and grades 10 through 12 and others attended schools configured kindergarten through grade 8 and grades 9 through 12 (18). Blyth and colleagues interviewed the students in grades 6, 7, 9, and 10. They looked at the students' global self-esteem, grades, achievement tests, and participation in extracurricular activities. Blyth and colleagues found that seventh grade female students in schools where transitions occurred in the seventh grade were more likely than female students in schools configured kindergarten through grade 8 to have drops in grade point average, self-esteem, and rates of participation in extracurricular activities. Seventh grade male students in schools where transitions occurred in the seventh grade similarly had lower grade averages than seventh grade male students in schools configured kindergarten through grade 8. Male self-esteem was not affected by school transitions. Adolescent males' rates of participation in extracurricular activity decreased in the seventh grade when they changed schools, but their rates of participation ultimately returned to the base level; the rates for females never returned to their base level.

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[13] The effects of school decisionmaking policies on teachers' attitudes and behaviors are examined in a separate section of this chapter below.

Becker found that students from the lowest income groups scored higher on achievement tests in elementary schools than adolescents from the same background in middle schools, suggesting that low-income groups fare better with elementary school structures than with middle school structures (11).

In an attempt to understand why school transitions cause difficulties for adolescents, some investigators have examined how different school arrangements mediate the effects of school transitions on adolescent health. Braddock and other investigators have found that schools where adolescents change classrooms for different content areas are associated with the majority of problems at transition (11,18,22). Braddock and colleagues found that seventh grade students appear to be most academically productive in schools where they interact with two or three different teachers rather than with six or seven (22).

Reviewing the evidence and building on developmental theories of adolescents, Eccles and Midgley found that structures and practices in middle or junior high schools are not suited to the developmental needs of early adolescents (57a). They argue that size differences, tracking practices, competitive motivational strategies, controlling teacher behaviors, using a lecture format and the absence of opportunities for students to practice autonomous behaviors all conflict with adolescent development. These investigators also found that transition effects (e.g., student attitudes about school) are mediated by changes in the school and classroom environment such that negative attitudes were associated with schools that were not developmentally appropriate.

To sum up, available research on school transitions is limited, but some evidence suggests that school transitions are associated with increased rates of suspension, retention in grade, and decreased levels of achievement, attendance, self-esteem, and participation in extracurricular activities. Female students seem to be particularly adversely affected by transitions that occur in the seventh grade. The research that has been conducted to date suggests that there may be better and worse developmental moments for shifting from one school to another; the experience of transition may in and of itself be traumatizing; and some school transitions may conflict with adolescents' developmental needs (72a). In addition, some research has shown that adverse effects can be ameliorated by specific changes in school environments such as prolonged contact with a single teacher rather than multiple classes and teachers (27).

Evidence for the Effects of Class Size on Adolescent Health

The evidence on the relationship between class size and adolescent health is somewhat difficult to interpret. In 1986, Robinson and Wittebols compiled a comprehensive review of the literature on class size and achievement for the Educational Research Service (174). Their review of 22 studies published from 1950 to 1985 found that 50 percent of kindergarten through grade 3 studies, 38 percent of the grade 4 through grade 8 studies, and 18 percent of the grade 9 through 12 studies indicate that small classes have a positive effect on student achievement. Robinson and Wittebols concluded that available research fails to show that small classes have a positive effect on high school students' achievement levels generally.

According to Fine, a class size of 15 to 20 seems to be substantially more productive when dealing with low-achieving students than a class size of 35 (72a). In high schools in which students are educationally disadvantaged, classes of 35 reinforce what Goodlad and others have written about—passive downtime will constitute upwards of 85 percent of most secondary classroom instructional practices (83). McNeil argues that such teaching is a structurally created characteristic of large schools and oversized classes (82).

To sum up, it appears that class size may have differential impacts on students in different grade levels. At the high school level, class size may have more impact on academically marginal students than on average students. Improved classroom size may be a necessary but not sufficient condition for improved academic achievement of academically marginal students (72a).

Evidence for the Effects of School Environments on Teachers' Attitudes and Behaviors

Studies examining the relationship between school environments and teachers' attitudes and behaviors are summarized in table 4-3. These studies relate contextual factors (e.g., working conditions, location, size) and teacher involvement in decisionmaking practices with teachers' attitudes and behaviors.

Corcoran and colleagues, analyzing national school and teacher survey data, report that many U.S. educators—especially urban secondary school teachers—experience poor working conditions (40). According to Corcoran and colleagues, poor working conditions reported by educators include substandard facilities, a lack of space, inadequate classroom materials, large classes, a lack of influence in decisions, and concerns about safety. These conditions are associated with high absenteeism, low effectiveness, low morale, and low job satisfaction. Moos found that teachers on whom work demands are high tend to rely more on rote teaching methods (143).

Various school reforms have been investigated by researchers as sources of influence on teacher behaviors (see table 4-3). One wave of reforms has emphasized "standards" and monitoring teacher behaviors in public schools. Bachrach and colleagues have characterized schools that operate under these reforms as schools organized around controlling teachers' activities, centralized decisionmaking, and rendering the curriculum "teacher-proof" (9). A more recent series of reforms, often called "restructuring," has emphasized bringing teachers into policy and decisionmaking processes.

National survey data indicate that teachers in urban and other schools where incentives and school policies are determined largely by school administrators report being more suspicious, feeling more contempt, having higher rates of absenteeism, experiencing lowered morale and feelings of powerlessness, and being distrustful of administrators (9). The majority of these teachers also experienced problems with inadequate instructional time, receiving minimal feedback from administrators, and the extensive use of standardized tests (9,40). Furthermore, teachers in schools where decisionmaking is centralized express a desire to be given a greater voice in decisionmaking and to have more communication with administrators (9).

Photo credit: Sharon Knarvik

Teachers' morale, sense of commitment, and other attitudes and behaviors that can be expected to improve the school environment for adolescents are enhanced by school reforms emphasizing collaborative and cooperative relations within schools.

School reforms emphasizing collaborative and cooperative relations within schools have been found to increase teacher satisfaction, successful implementation and maintenance of new practices, morale, sense of ownership and commitment, while they tended to decrease rates of absenteeism (9,24, 40,194). Furthermore, educators who reported having a substantial say in shaping policy also report more positive views of adolescents and more optimism that they can make a difference in the adolescent's academic accomplishments (72a).

To sum up, there is clear evidence that teachers are negatively affected by poor working conditions and administrative policies that centralize decisionmaking and use narrow authority structures. Teachers' attitudes and behaviors that can be expected to improve the school environment for adolescents are enhanced by a collective and cooperative school environment.

Table 4-3—Evidence for the Relationship of Various School Environments to Teachers' Attitudes and Behaviors

Study[a]	School environment	Adolescent health
	Poor working environment	
Corcoran, White, and Walker, 1988 (national school and teacher survey data)	Urban schools where teachers expressed concerns about substandard physical conditions, lack of space, resources, safety, and classroom size.	Poor working conditions related to absenteeism, low effectiveness, low morale, and low job satisfaction for teachers—especially for urban secondary school teachers.
	Schools in which teachers are required to use standardized testing.	Teachers report that standardized tests are a threat to their professionalism.
Moos, 1985	Schools where very high work demands are placed on teachers.	Teachers in such schools tend to rely more on rote learning teaching methods.
	Centralized decisionmaking with little input from teachers	
Bachrach, Bauer, and Shedd, 1986 (national survey of teachers)	Schools in which policies and incentives are made by administrators.	Teachers who report having minimal input to decisions concerning their working conditions and incentives had higher rates of absenteeism and lower morale.
	Schools are currently organized around controlling teachers' activities, centralized decisionmaking and rendering curriculum "teacher-proof." Majority of teachers experience problems with instructional time, problems receiving feedback from administrators.	Teachers are alienated, tired, and feel powerless.
Pallas, Natriello, and McDill, 1989	School social climate perceived as positive.	Teachers' perceptions of mean ability of students in their classroom were positively related to perceived school social climate (regardless of the actual ability levels of their students).
	Positive school climate.	Positive school climate is positively related to the extent to which there seems to be a shared sense of purpose among teachers—goal consensus.
Bryk, Lee, and Smith, 1990	Increased administrative control and narrowing of authority of teachers.	Teachers expressed that they did not feel a part of the school community and that people did not listen to their ideas (alienation).
Bachrach, Bauer, and Shedd, 1986	Centralized decisionmaking in schools.	Teachers report being more suspicious, feeling more contempt, having deteriorated morale, and being distrustful of administrators; teachers indicate that they should be given a greater voice in decisionmaking; teachers reported dissatisfaction with communications with administrators.
	Schools in which teachers' classroom policies are controlled.	Teachers have higher rates of absenteeism and lower reported morale.
Fine, 1984	Teachers' perception of influence in shaping policy.	Educators who saw themselves as powerless tend to view adolescents they work with as beyond help; educators who report having substantial say in shaping policy also report more positive views of adolescence and more optimism about making a difference.
	Collaborative environment with teachers involved in decisionmaking	
Bryk and Driscoll, 1988	Schools that have collaborative relationships between teachers and administrators and schools that focus on cooperative processes.	Teachers report increased satisfaction; decreased rates of absenteeism.

Table 4-3—Evidence for the Relationship of Various School Environments to Teachers' Attitudes and Behaviors—Continued

Study[a]	School environment	Adolescent health
Stevenson, 1987	Collective and cooperative school climate.	Teachers report enhanced sense of ownership, more successful implementation of new practices.
Lifton, 1988; Dade County Public School, 1988 (preliminary evidence from teacher surveys in restructured school district)	Schools restructured to give teachers more input into decisionmaking.	Preliminary evidence that teacher morale, commitment, willingness to continue teaching are enhanced.
Corcoran, White, and Walker, 1988 (national school and teacher survey data)	Small schools, with high levels of teacher influence and with staff cohesion.	Teachers in such schools expressed more positive attitudes towards students.

[a] Full citations are listed at the end of this chapter.

SOURCE: Office of Technology Assessment, 1991.

Evidence for the Effects of Teacher Behaviors on Adolescent Health

Limited evidence suggests that the behaviors of teachers and students are interconnected. Educators using team teaching (where teachers share responsibility for a group of students either within or across schools) affect adolescent health in a positive way. Furthermore, teachers in schools with centralized decisionmaking, where there is little coordination between the efforts of teachers and school administrations, are more likely to use authority and coercion as part of their instructional style, which also affects adolescent health.

Studies have found that adolescents who have teachers that use team teaching have increased levels of academic achievement and are more likely to develop interracial friendships (24,124,141). Team teaching approaches also have been associated with decreases in student dropout, delinquency, and suspension (75,178). Further, the use of coercive techniques by teachers has been associated with lowered self-esteem among students and increased frequency of classroom disruption (137). Students who report that they are treated disrespectfully by their teachers report higher rates of feelings of alienation and school victimization (85). Furthermore, in schools where coordination between teachers and principals is poor, adolescents are more likely to have high discipline and criminal problems (133).

Evidence for the Effects of School Policies Regarding Cultural Diversity on Adolescent Health

It has been argued that "social education" in which students come to learn about and respect critically and creatively their own ethnic and racial heritage is important so that adolescents can generate strategies for managing difference as difference, not as deficits (73). It also has been argued that schools as they are currently organized do not educate students about ethnic diversity and students are, therefore, more likely to form stereotypes and have their racial and other biases reinforced (69,73). There is currently considerable debate—and limited evidence—about how to celebrate, rather than disparage, cultural diversity (58a).

Research that has examined the effects of schools on racial and ethnic minority adolescents' health outcomes[14] suggests that there are insidious school processes that differentially affect minorities. For example, when schools ignore ethnic differences in their social arrangements and in their curriculum, there are consequences for minority adolescents related to academic achievement and the degree of attachment to their own ethnic group. Iadicola compared schools that differed with respect to the degree of Hispanic cultural influence on the curricula and the percentages of non-Hispanic white and Hispanic students. Iadicola found that Hispanic students in schools with a high degree of non-Hispanic white cultural influence were more likely to express lower levels of attachment to their own group (102). It could be argued that schools in low-income communities that do not embrace cultural differences are structured so that Hispanic students are forced to "make a choice"—between self and family and between personal development and community involvement (102). Obgu has argued that racial stratification and classroom materials that reflect the perspective of whites with little or no acknowledgement of minorities results in black adolescents' behaving in ways that undermine their academic success (157a). Some studies suggests that multicultural education and school-based collaborations with minorities in the community can improve minority adolescents' academic achievement (43,102). In interviews with students and educators, Fine found that students in integrated schools valued differences between diverse groups as strengths, not defects (70). In contrast, students in a fully segregated school learned stereotypes and had their racial biases reinforced (70). However, there is still considerable confusion among teachers and others about defining and implementing multicultural education (58a). According to one informed observer, the support that multicultural education needs will come only from comprehensive policymaking and from teachers who see differences among students as reasons for "celebration" rather than for handwringing (58a).

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[14] The delivery of health and related services to racial and ethnic minority adolescents is discussed in ch. 18, "Issues in the Delivery of Services to Selected Groups of Adolescents," in Vol. III.

Table 4-4—Evidence for the Relationship of Parental Involvement in Schools to the School Environment and Adolescent Health

Study[a]	Form of parental involvement	School environment	Adolescent health
Svec, 1986 (experimental study)	In experimental study, randomly assigned high school dropouts went to school with or without parents to negotiate reentry to school.		More schools refused the dropouts who did not have their parents with them.
Bryk, Lee, and Smith, 1990 (review)	Parents expect achievement and place importance on educational attainment.		Parental expectations are highly and consistently related to academic outcomes.
	Parents volunteer in schools.		Parental volunteering is associated with positive outcomes, especially for elementary school students.
	Parent involved in professional councils at school sites.		Intervention had no significant influences on student academic achievement.
	Decentralization (community control) in New York City.	Principals are more sensitive to community interests, schools have more legitimacy in the community, culturally relevant curriculum is developed.	Intervention had ambiguous impact on student achievement.
Fine, 1989; Fine and Phillips, 1990 (interviews with educators and with low-income parents of middle-school students)	Parents' presence at schools.	Especially with low-income students, parents' presence serves as a reminder to teachers that they need to be concerned about the impact of school on their students.	Students whose parents question school policies are more likely to receive fair treatment.
Comer, 1988 (intervention among 3rd, 4th, and 5th graders in schools in low-income districts in New Haven, Connecticut, and Maryland)	As part of a comprehensive school intervention program, parents work closely with school administrators, teachers, a mental health specialist, and a nonprofessional support person to meet the emotional, social, psychological, and academic needs of their children. Some parents work as classroom assistants, tutors, or aides; some join the school's governing body.	Relations between parents and school staff improve. School administrators, staff, and parents' collaboration results in increased organizational effectiveness.	Preliminary evidence suggests intervention improved reading, language, and math scores. Behavior problems declined.

[a] Full citations are listed at the end of this chapter.

SOURCE: Office of Technology Assessment, 1991.

Evidence for the Effects of Parental Involvement in Schools on Adolescent Health

Research on parental involvement has been limited until recently to national surveys that focus on traditional forms of involvement by parents. Investigators have examined the effects of parental expectations, parental volunteering, and parental presence in schools and have generally found—especially when research findings are related to local school districts—that parental involvement is beneficial to adolescents (see table 4-4).

Probably the most thoroughly documented effect that parents have on adolescent health is related to their expectations that their children will achieve. A review by Bryk and colleagues noted that studies consistently find that parents who expect their children to achieve and who place importance on educational attainment affect their levels of academic achievement (25). Although not as well documented, evidence suggests that adolescents are also positively affected by the presence of their parents at school—whether at school to volunteer, to serve as advocates for their children, or simply to be present (25,70,73,195). The importance of parental involvement is recognized in Comer's comprehensive school interventions, first implemented in New Haven, Connecticut, elementary schools, and now being implemented in more than 50 schools around the country, including 2 middle schools and a high school (35) (see box 4-A).

In a recent review, Bryk and colleagues noted that parental involvement on professional councils at school sites in Salt Lake City had no significant influence on student academic achievement (25). These investigators also described a study of community control in New York City. This evaluation found that parental choice had an ambiguous effect on student achievement (25).

Summary: School Influences on Adolescent Health

Although it is limited, of variable methodological quality, and difficult to conduct, available research strongly suggests the importance of school environments on academic achievement and on adolescents' health. Studies in the last 20 years provide contrast to earlier studies that led many to believe that schools make little difference (32a,103a). These earlier studies have been criticized because they focused mainly on a limited measure of attainment and examined a very narrow range of school variables (175a). According to Rutter's studies in England, and a host of studies in the United States reviewed in this chapter, social variables account for much of the variation between schools, and hence some of the variation in adolescent health (175a). Generally, school policies found to have adverse effects on the minority, low-income, academically marginal students include MCTs without the addition of academic supports, academic tracking, large school size, punitive orientation, little support during transitions between levels of schooling, and lack of cultural diversity and appreciation of racial and ethnic differences. School policies generally found to have positive effects on adolescent health include participatory decisionmaking, parental involvement in schools, and a *combination* of other process variables (178). Effects of the school environment on adolescent health are often mediated through teachers' attitudes and behaviors and through adolescents' academic achievement, most prominently retention in grade and school dropout. *The most compelling evidence suggests that improving schools to benefit adolescents requires a combination of approaches. This combination can be summarized as a school that is a small, comfortable, safe, intellectually engaging, and emotionally intimate community (72a). Transitions are minimized, and when they must occur, they are managed with a view toward meeting the developmentally appropriate needs of adolescents. Teachers are encouraged to initiate and develop new programs that are sensitive to the diversity of their students. The curriculum responds to individuality as well as to differences, while developing a common knowledge base among students in a particular school. Teacher, parent, and student participation in decisionmaking is encouraged.* Unfortunately, this combination of features characterizes few schools, particularly those public schools serving socioeconomically and educationally disadvantaged students, many of whom are racial and ethnic minorities.

Box 4-A reviews selected promising interventions that attempt, at least in part, to address the shortcomings of many contemporary American schools.

Major Federal Policies and Programs Related to Education

As discussed elsewhere in this Report, Federal programs related to education are primarily the responsibility of the U.S. Department of Education.[15] The U.S. Department of Labor also has some responsibilities in this area.

U.S. Department of Education

In 1989, the U.S. Department of Education had a budget of approximately $22 billion and was responsible for 187 programs spanning six different offices (see figure 4-4). The U.S. Department of Education does not administer educational programs targeted specifically to adolescents but includes adolescents as part of the school-aged population. It is impossible to determine total expenditures on adolescents, because U.S. Department of Education funds are distributed to State and local educational agencies that determine their own priorities.

The U.S. Department of Education's priorities include increasing educational services to econom-

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[15] See ch. 19, "The Role of Federal Agencies in Adolescent Health," in Vol. III.

Box 4-A—Innovative Approaches to Improving American Schools[1]

In recent years, promising interventions in schools have been tested and found to demonstrate beneficial effects on adolescent health through their effects on adolescents' levels of academic achievement, school persistence, attitudes toward school, self-esteem, and confidence. These interventions, discussed further below, are generally of two major types:

- interventions that are focused on *improving individual learning and preventing selected health problems associated with school failure* (e.g., adolescent pregnancy and parenting); and
- interventions that are focused on *changing school and/or community environments.*

Interventions focused on individual learning and preventing selected health problems associated with school failure include peer tutoring interventions; cooperative learning interventions; summer learning interventions; and interventions that provide incentives and supports to students to graduate and go on to college. Interventions focused on improving school environments include the School Development Program developed by Yale child psychiatrist James Comer and also include some school-linked health centers (SLHCs). Examples of these two major types of interventions that have undergone some evaluation and seem to show some promise are discussed below. Also discussed below is the "comprehensive school/community health" model, which is drawing considerable attention from researchers and policymakers who are concerned about the health of U.S. adolescents (27,107b,108b,147).

Promising Interventions Focused on Improving Individual Learning and Preventing Selected Health Problems Associated With School Failure

As noted above, interventions that focus on improving the skills of low-achieving students through means that do not involve academic tracking include peer tutoring interventions, cooperative learning interventions, summer learning interventions, and, most recently, interventions that provide incentives and supports to students to graduate and go on to college. Several interventions that offer a more intensive focus on individual students than can typically be found in the large public schools that are attended by many minority, poor, and academically at-risk adolescents are discussed below. All of the interventions discussed below have undergone at least some preliminary evaluation in terms of outcomes for adolescents and appear to hold some promise for enhancing adolescents' adaptation to school.

Peer tutoring interventions—Peer tutoring means using older or same age students to work individually with students to teach a particular content area. Peer tutoring strategies emerged from concerns about how educators can deal creatively with 35 students or more, engage students in appreciating rather than depreciating peer differences, and promote active participatory learning among students. Generally, peer tutoring appears to be an effective approach for adolescents. Some studies have found peer tutoring to be less costly than computer-assisted instruction, to enhance levels of academic achievement beyond those found in conventional classes, and to be beneficial for tutors and tutees (31,97,121).

Cooperative learning interventions—Teachers using cooperative learning strategies create groups where each student has exclusive knowledge of a topic and where the students need to work together as a group to create a final product. This strategy often stimulates interdependency among students. Cooperative learning appears to satisfy many educational ends simultaneously (104,206). Cooperative learning enables heterogeneous groups of students to work across ability levels, thus reducing the need to track students. It encourages students to participate actively as teachers and as learners with their peers. It facilitates empathy across and within racial, ethnic, and ability groups, and it shifts the questions of absolute authority away from teachers.

In elementary schools, cooperative learning strategies tend to enhance students' academic achievement, teaching instruction, and students' sense of empathy (6,152). Investigators have sought to document the effects of cooperative learning on achievement in secondary schools. One analysis of 27 selected studies involving 37 comparisons of cooperative v. control learning strategies concluded that over two-thirds of the studies favored cooperation (207). Math and language arts seem to be the curricular areas most amenable to positive effects of cooperative learning.

Summer learning interventions—Particularly for socioeconomically disadvantaged students, summers are typically a time of enormous educational regress. Heyns argues that schools that provide educational interventions

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[1] Evidence on preschool interventions will not be taken up in this chapter.

Continued on next page

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Box 4-A—Innovative Approaches to Improving American Schools[1]—Continued

during the summer to low-income and academically disadvantaged students can and do reduce disparities in the academic skills associated with the background characteristics of children and adolescents (99).

The Summer Training and Education Program (STEP) is an intervention designed to help reduce dropout levels among poor and educationally deficient youth by focusing on two factors that are closely associated with dropping out of school: poor academic performance and adolescent parenthood (184a). STEP targets low-income 14- and 15-year-olds who are performing below grade level in either reading or math and offers them two consecutive summers of remediation, life skills instruction and work experience, and various support services (e.g., counselor advocates and group meetings) during the intervening school year. The goal of STEP is to reduce participants' summer learning losses, increase their reading and math skills, increase their graduation rates, and decrease their pregnancy and parenting rates.

A national evaluation of STEP managed by the Philadelphia nonprofit corporation Public/Private Ventures is comparing STEP participants' outcomes to outcomes for a control group of students in the federally funded Summer Youth Employment and Training Program (who received remedial education and a summer job but no other support services) (184a). Preliminary results from the evaluation indicate that STEP minimized participants' academic losses over the summer.[2] Furthermore, STEP increased participants' reading and math scores and increased their knowledge of contraception (184a). Preliminary findings regarding STEP's impact on dropout rates among participants are consistent with the hypothesis that STEP reduces dropout behavior but are based on small numbers and are not statistically significant. Firm conclusions about STEP's long-term effects on participants will have to await the completion of the research in 1993.

Interventions to provide incentives and support for adolescents to graduate and go on to college— Eugene Lang's celebrated I Have a Dream (IHAD) Project is perhaps the best known of these types of interventions. The IHAD project began when Lang promised to pay college tuition fees for a class of sixth-graders then preparing to graduate from his elementary school alma mater (99a). Lang realized quite quickly, however, that while a tuition guarantee was essential, if IHAD students were to graduate, they would need considerable additional social and academic support. The basic features of all IHAD projects have come to include "a sponsor,[3] a tuition guarantee, a project coordinator,[4] and additional support services [for students (e.g., tutoring, cultural enrichment)]" (99a). IHAD student participants are known as "Dreamers" (99a).

The publicity surrounding Lang's project helped it become the formal prototype for many similar programs—140 by summer 1990, at a total cost in private funds of $50 million, according to a 1991 report by Public/Private Ventures (99a). Evaluating the effectiveness of IHAD projects is difficult, however, both because IHAD sponsors have been reluctant to allow formal research (99a,207a) and because individual IHAD and similar projects (207a) vary considerably within the basic framework.

Public/Private Ventures obtained permission from the Greater Washington IHAD Foundation to evaluate its IHAD Projects, most of which were begun in the 1988-89 school year.[5] It is too early to tell whether the Greater Washington area projects will be effective in achieving their ultimate objective of high school graduation and college entry (99a).[6] However, Public/Private Ventures' preliminary 1-year review of three of the Washington area's IHAD projects, based on interviews with 14 of the Dreamers and project coordinators, found that IHAD was a "promising" intervention (99a). In its 1-year review, Public/Private Ventures found that:

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[2] See ch. 10, "Pregnancy and Parenting: Prevention and Services," in this volume for further discussion of the national evaluation of STEP.

[3] Sponsors are the individuals who guarantee the college tuition and provide financial support for other aspects of IHAD projects. Contacts between sponsors and Dreamers are infrequent, but according to Public/Private Ventures' evaluation, "they are valued by both groups" (99a). Personal contact seemed to be central to the meaning sponsors derived from IHAD support, as opposed to more anonymous forms of charity (99a). Comments by Dreamers suggested that "some Dreamers develop commitment to IHAD's [achievement] goals as a way to reciprocate sponsors' generosity (99a).

[4] According to Public/Private Ventures, "the relationship with the project coordinator is a Dreamer's crucial link to the IHAD program": "Project coordinators represent a continuous stable source of support for these youth. Unlike teachers, project coordinators provide a haven in the midst of a school environment that can be indifferent or competitive. . .Project coordinators advocate for Dreamers within a school and leverage additional resources, such as tutoring, trips or concrete assistance during emergencies. They can and do drive youth to school, thus improving attendance, and bring in parents for teacher consultations, thus increasing parental involvement" (99a). Many Dreamers form strong emotional attachments to project coordinators. However, contacts with project coordinators are voluntary and vary among students and project coordinators. Project coordinators are not formally associated with the students' schools.

[5] The Public/Private Ventures evaluation is funded by a private foundation (99a). Various supporters back the 8 classes now overseen by the Greater Washington IHAD Foundation. An initial sponsor formed the Greater Washington IHAD Foundation and convened a class in 1987. Sponsors as of September 1990 included individual benefactors (three classes); pairs of business executives (three classes); a group of professional athletes and a business executive (one class); and two churches (one class) (99a).

- the IHAD intervention had targeted and reached very disadvantaged youth;
- the timing of the IHAD intervention (at the end of fifth or sixth grade—the beginning of junior high or middle school entry) was "developmentally propitious";
- the IHAD model seemed to have a positive effect on Dreamers' attitudes towards education, and
- the IHAD intervention provides adult relationships (i.e., sponsors, project coordinators, mentors[7]) that are meaningful to youth (99a).

On the other hand, Public/Private Ventures expressed concern that "support services, especially tutoring, are necessary program components, but are provided unevenly" (99a). It also noted that enrichment activities (e.g., a summer program for Dreamers) and incentive awards are inconsistently delivered within each school and among schools. Project coordinators were found to be overburdened and in need of help in gaining access to social services for their students (99a). Public/Private Ventures found that the "inconsistency of the services is probably inevitable within the present Foundation structure" and that "the quality of Foundation-wide activities, such as the summer school, is worrisome" (99a). The evaluators recommended additional oversight by the Greater Washington IHAD Foundation's board of directors to improve these aspects of the program.

IHAD raises an interesting public policy dilemma (99a). According to Public/Private Ventures, the benefits of IHAD may derive from IHAD's private sponsorship:

> IHAD's unique contribution may be exclusive to the private sector: an association with a wealthy and even famous benefactor. This benefit can have immense repercussions for a youth from a poverty background: a sudden change of luck, intermittent reminders of a special status, and a long-term commitment by a distant and powerful advocate. Publicly funded interventions can probably never deliver this sense of a special connection, or elicit the high expectations that youth—and some school officials—attribute to sponsors (99a).

Nonetheless, it may be that many of the elements of IHAD—the project coordinator who provides a haven for adolescents in a competitive and often hostile school environment, tutoring, the link to intensive social and academic support services, guaranteed college tuition—can be reproduced in school and community settings using public funds.

Promising Interventions Focused Largely on Changing School and Community Environments

While some interventions focus on improving the school adaptation of selected individuals, other interventions focus largely on changing school and sometimes community environments, although they may "build in" individually focused attention (e.g., 35). The primary purpose of interventions focused on changing these environments is to make schools (and, sometimes, communities) more health-promoting environments for adolescents. One of the most frequently cited of these approaches to improving school environments is Comer's School Development Program (35). In addition, proponents of SLHCs often view SLHCs as a means of integrating a health perspective into a school, as well as a way to deliver health and other nonacademic services to individual adolescents (141a).[8] These approaches come under the general rubric of "comprehensive school health" (107b,108a), establishing the school as a health-promoting environment (27), or school/community linkages to promote adolescent health (147).

Comer's School Development Program—A longitudinal study of an intervention developed by Yale University child psychiatrist James Comer provides strong evidence that creating a collaborative dynamic between educators and parents, as opposed to the traditional social service bureaucratic relationship, markedly advances both

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[6] A news article reported mixed results for the initial Eugene Lang class in New York City (152b).

[7] Mentors were provided by IHAD at only one of the schools. In this school, approximately 30 employees of the sponsors' company "adopted" two Dreamers each: "They phone the Dreamers, wrote them letters and attended company-sponsored trips and dinners with them. . .Additional contacts could be initiated if either the mentor or the youth desired [and they often were]" (99a). Public/Private Ventures' evaluation notes that mentors were sometimes frustrated by the differences in values between the mentors and the Dreamers, and that one mentor recommended training for mentors and matching youth with mentors from similar backgrounds (99a). Interventions using mentors to prevent specific adolescent health problems are discussed in other chapters in this volume; there are no evaluations of such interventions available.

[8] The role of SLHCs in health services delivery are discussed further in Vol. I of this Report, *Summary and Policy Options*, and in ch. 15, "Major Issues in the Delivery of Primary and Comprehensive Health Services to Adolescents," in Vol. III.

Continued on next page

Box 4-A—Innovative Approaches to Improving American Schools[1]—Continued

organizational responsiveness to students' personal needs and students' academic work (35). Unlike some current educational reforms which focus on instruction and curriculum, the Comer intervention is based on the understanding that "many kinds of development, in social, psychological, emotional, moral, linguistic, and cognitive areas, are critical to future academic learning" (35).

The Comer intervention, also known as the School Development Program, seeks to overcome what Comer terms "a basic problem underlying the schools' dismal academic and disciplinary record: the sociocultural misalignment between home and school" (35). For many black and Hispanic children whose parents have had a traumatic social history, Comer suggests, education must do more than teach the basics (127a). It must also address students' emotional, social, and psychological needs (127a). The School Development Program has three goals: 1) to induce parents to participate in the school's life; 2) to force school administrators, teachers, and other staff to share authority in managing the school; and 3) to bring guidance counselors, mental health professionals, and teachers into a team that meets regularly to combat behavior problems (127a). A school governance and management team, consisting of parents and teachers, the principal, a mental health specialist, develops a comprehensive school plan covering academics, social activities (e.g., potluck suppers to teach children social skills and enable parents to meet teachers), and special programs. A mental health team assigns a member to work with a child who is having difficulty and tries to identify whether some school process is contributing to the behavior. Parents are also encouraged to become classroom assistants, tutors, or aides.

The Comer process has already been adopted by more than 100 schools in nine districts in eight States (127a). In the schools where Comer's programs are being implemented, the evaluation data for at-risk students are very encouraging. In the two New Haven elementary schools where the program was implemented, behavioral problems in the schools declined and math and reading scores climbed. Similar results were achieved, from 1985 to 1987, in 10 predominantly black schools involved in the Comer program in Prince Georges County, Maryland (35). A more rigorous evaluation of the Comer intervention in Prince Georges County is being developed.

School-linked health centers[9]—As discussed further elsewhere in this Report, SLHCs vary in the services they offer. Comprehensive SLHCs (and comprehensive community-based centers for adolescents) are centers that aspire to provide health services that address the range of problems that many adolescents face: care for acute physical illness, general medical examinations in preparation for involvement in athletics, mental health counseling, laboratory tests, reproductive health care, counseling for family members, prescriptions, advocacy, and coordination of care. The more comprehensive of the centers may also offer adolescents additional services, such as educational services, vocational services, legal assistance, recreational opportunities, child care services and parenting education for adolescent parents. The defining feature of a comprehensive service center for adolescents is the extent to which the center attempts to be responsive to the specific needs of adolescents by, for example, offering free care or using sliding-fee schedules for payment, evening and weekend hours of operation, confidentiality of services, and staff members who are knowledgeable about and committed to adolescents. OTA has concluded that SLHCs are the most promising recent innovation to improve U.S. adolescents' access to health and related services. Although there is as yet little systematic evidence that SLHCs for adolescents improve health outcomes, there is clear evidence that such centers can improve adolescents' access to the health and related services that adolescents are most likely to need.

In the opinion of many observers, however, SLHCs are not just a site for delivering health services to adolescents. SLHCs can be a means of integrating a health perspective into a school and making schools more health-promoting environments. They can provide health services to faculty, provide linkages with health professionals and services outside the school building, serve as a source of referral and consultation for teachers and students, and make health-promoting suggestions to school administrators. Perhaps as a consequence of this perspective on SLHCs, some evaluations of SLHCs have focused on whether the presence of an SLHC improves the health of the entire student body in a school, not just the users of clinic services (e.g., 107c). However, it is as yet difficult to make judgments about the ability of SLHCs to improve school environments and so influence the health of entire student bodies: there have been few evaluations and those that have been conducted are methodologically weak; hence, findings concerning impact are mixed.[10] Most important, however, evaluations have not formally evaluated whether SLHCs have become fully integrated into schools.

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[9] See Vol. I of this Report, *Summary and Policy Options*, the "Report Brief," and ch. 15, "Major Issues in the Delivery of Primary and Comprehensive Health Services to Adolescents," in Vol. III.

The comprehensive school/community health model—An increasing recognition that there are inherent limitations to what individuals, the traditional health care system, schools, and social services can do on their own to promote and improve adolescent health has led observers to recommend more comprehensive and integrated approaches. Evaluations of SLHCs (see above) by Kirby and others have pointed to the need for additional integration of SLHCs into schools and communities (e.g., 2a,107c). In their review of the provision of mental health services in SLHCs, for example, Adelman and Taylor suggested that SLHC-based mental health services take a more preventive orientation, in part by becoming better integrated into the daily life of a school (2a). Kirby and his colleagues suggested that SLHCs develop communitywide programs involving parents, youth-serving agencies, religious and other community leaders, and the media (107c).

One approach to integrating school and community programs offered by Kirby makes the *community* the center of the effort: programs are subject to community control and programs are overseen by a "child health council" (107b). Because schools are the one institution regularly attended by most young people ages 5 to 16, however, Kirby suggests that "schools represent the public institution with the greatest opportunity for playing an important role in improving the health of most youth" (107b). According to Kirby, a comprehensive school/community health program at the *school level*:

- includes health instruction, school health services, other school activities, and a reinforcing school environment;
- integrates special programs for parents and includes adult mentors; and
- has linkages with health and youth-serving agencies, churches, businesses, and local media (107b).

Thus, schools are the central locus of efforts to promote and improve adolescent health, but they are not expected to act alone (see also 27,147).

As pointed out by Kirby and others (107b,147), the implementation of comprehensive school/community health programs has been impeded by the failure to resolve some important issues. Key issues include resistance by schools to adopting additional responsibilities and a lack of formal evidence that integrated school/community programs are more effective than more segmented efforts (107b). Recently, however, a sense of urgency about adolescent health and achievement has stimulated many learned observers, including those in the education community, to come out in support of a greater role for schools in improving adolescent health (e.g., 27,147). **The analysis in this chapter (and throughout this Report) strongly suggests that a key to improving adolescent health would be to encourage the view of schools as environments that can either promote or impede adolescent health, rather than merely as settings in which to place additional responsibilities, such as the delivery of additional "programs," without providing additional supports.**

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[10] See ch. 15, "Major Issues in the Delivery of Primary and Comprehensive Health Services to Adolescents," in Vol. III.

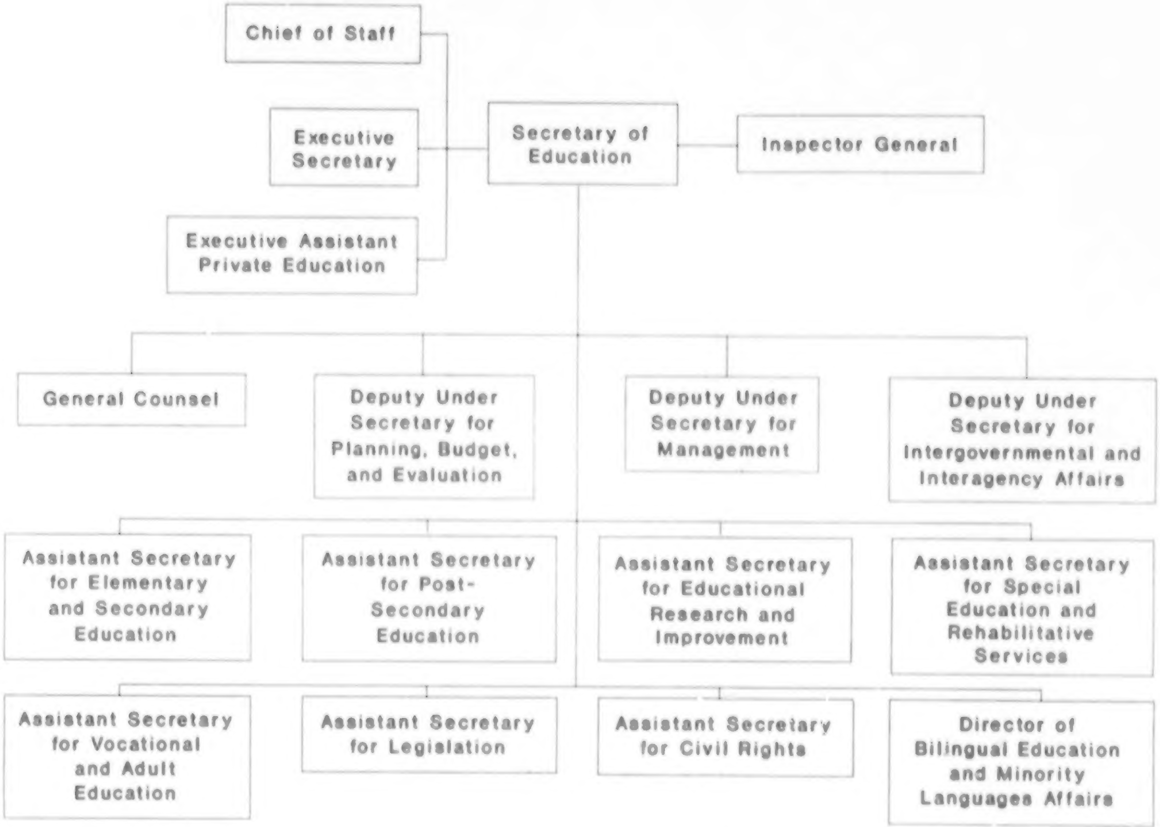
SOURCE: Office of Technology Assessment, 1991.

ically and educationally disadvantaged children. For the past two decades, the primary Federal vehicle for helping schools meet the educational needs of educationally disadvantaged children (i.e., children performing below their appropriate grade level, children of migrant workers, children with physical disabilities, and neglected or delinquent children under State care) has been grant programs authorized by Chapter 1 and administered by the Office of the Assistant Secretary for Elementary and Secondary Education.

The Office of the Assistant Secretary for Elementary and Secondary Education has one of the largest appropriations in the U.S. Department of Education, approximately $6.6 billion in fiscal year 1989. Although the proportion of funding allocated to adolescents cannot be precisely determined, major programs that provide adolescent-related efforts include the following:

- Chapter 1 grants to provide financial assistance to State and local educational agencies to meet

Figure 4-4—U.S. Department of Education


Chief of Staff
Executive Secretary
Executive Assistant Private Education
Secretary of Education
Inspector General
General Counsel
Deputy Under Secretary for Planning, Budget, and Evaluation
Deputy Under Secretary for Management
Deputy Under Secretary for Intergovernmental and Interagency Affairs
Assistant Secretary for Elementary and Secondary Education
Assistant Secretary for Post-Secondary Education
Assistant Secretary for Educational Research and Improvement
Assistant Secretary for Special Education and Rehabilitative Services
Assistant Secretary for Vocational and Adult Education
Assistant Secretary for Legislation
Assistant Secretary for Civil Rights
Director of Bilingual Education and Minority Languages Affairs

SOURCE: U.S. Department of Education, organizational chart, Washington, DC, Sept. 15, 1989.

the special educational needs[16] of disadvantaged children and adolescents;[17]
- education of homeless children and youth, as authorized by the Stewart B. McKinney Homeless Assistance Act;
- Indian education programs, as authorized by the Indian Education Act of 1988;
- training for elementary and secondary school teachers in math and science, as authorized by the Dwight D. Eisenhower Mathematics and Science Education, Hawkins-Stafford Amendments of 1988; and
- drug abuse education and prevention coordination in States and communities, as authorized by the Drug-Free Schools and Communities Act of 1986.

Chapter 1, Title I of the Elementary and Secondary Education Act, provides Federal assistance for State and local programs of education for disadvantaged U.S. pupils at all levels, from prekindergarten through secondary school (202a). The fiscal year 1989 appropriation for Chapter 1 was $4.6 billion, making this program the largest program of aid to elementary and secondary education in the United States.

Chapter 1 was initially authorized as Title I of the Elementary and Secondary Education Act in 1965 (202a). In 1988, Congress reauthorized the Chapter 1 program, again as part of the Elementary and Secondary Education Act, in the Augustus F. Hawkins-Robert T. Stafford Elementary and Secondary School Improvement Amendments of 1988 (Public Law 100-297) (202a). The 1988 law, better known as the Hawkins-Stafford Act, made a number of changes in State and local educational agency programs of Chapter 1.[18] Among other things, the Hawkins-Stafford Act provided for the following:

- *incentives to enhance accountability and improve performance*—the Hawkins-Stafford Act contained several provisions aimed at evaluating the performance of individual pupils, schools, and local educational agencies served by Chapter 1 and at providing Federal assistance to improve this performance. The law specifies that if an individual pupil participates in Chapter 1 for a year without academic improvement, the local educational agency must consider changing the services provided to that pupil. If the aggregate performance of pupils in a school fails to improve over 1 year, the local educational agency must develop a program improvement plan. It is important to note that the law allows State and local educational agencies a great deal of flexibility in setting the standards to which they are to be held accountable.

- *programs to increase parental involvement in the education of Chapter 1 participants*—The law requires local educational agencies to implement procedures "of sufficient size, scope, and quality to give reasonable promise of substantial progress toward achieving the goals" of informing parents about the Chapter 1 program, training parents to help instruct their children, and consulting with parents. The agencies are required, among other things, to develop written policies for parental involvement in planning and implementing Chapter 1 programs, to convene an annual meeting of parents, and to provide program information and an opportunity for regular meetings for parents if the parents so desire. The law gives general guidance and lists numerous examples to illustrate the types of authorized parental involvement activity that would allow local educational agencies to meet their responsibilities—e.g., parent training programs, the hiring of parent liaisons, the training of school staff to work with parents, the use of parents as tutors or classroom aides, and parental advisory councils—but it leaves local educational agencies with about the same level of flexibility in the area of encouraging parental involvement as they had before. Thus, it remains to be seen what impact the new provisions will have on the actual level of parental involvement.[19]

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[16] Federal support for "special education" programs under Public Law 94-142, the Education of the Handicapped Act, as amended, is not discussed in this chapter. See ch. 19, "The Role of Federal Agencies in Adolescent Health," in Vol. III, and ch. 11, "Mental Health Problems: Prevention and Services," in this volume.

[17] No age breakdowns are available for current funding of Chapter 1. However, in the 1987-88 school year, 21 percent (1,037,127) of the population served were students in grades 7 through 12 in both public and private schools, with funding for these adolescents totaling $3.8 billion.

[18] Local educational agency programs of Chapter 1 represent about 90 percent of Chapter 1 funding (202a). Chapter 1 local educational agency grants are calculated by the Federal Government on a county basis. State education agencies receive the aggregate funds for counties in their States, then allocate the county amounts to individual local educational agencies.

- *programs for secondary school pupils and school dropouts*—The Hawkins-Stafford Act devoted substantial attention to establishing programs specifically for compensatory education of secondary school students. Although local educational agencies have always been authorized to use Chapter 1 funds for secondary school students, Chapter 1 services have historically been focused on pupils in kindergarten through sixth grade. In 1985-86, for example, about 88 percent of all Chapter 1 basic grant participants were enrolled in kindergarten through grade 6, while only 5 percent were in grades 10 through 12. Two different titles of the Elementary and Secondary School Education Act, as amended by the Hawkins-Stafford Act, provide authorizations for programs of school dropout prevention and secondary school basic skills improvement: Title VI and Title I, Chapter 1, part C.

  —Title VI contains 1-year demonstration grant authorizations under the School Dropout Demonstration Assistance Act of 1988 and the Secondary Schools Basic Skills Demonstration Assistance Act of 1988. The former act authorizes demonstration grants to local educational agencies for dropout prevention and reentry activities both within schools and in cooperation with community organizations and businesses.[20] Dropout prevention and reentry activities may include services to address poor academic achievement, work-study programs, services intended to improve student motivation and the school learning environment, remedial services to youth at risk of dropping out, occupational training, educational programs offering jobs or college admission to students who complete them, summer employment, etc. The fiscal year 1989 authorization for this program to address school dropout programs was $50 million; the appropriation was $21.7 million (202a).[21] [22] The Secondary Schools Basic Skills Demonstration Assistance Act authorizes a program of national demonstration grants to local educational agencies for activities to help educationally disadvantaged secondary school students attain grade level proficiency in basic skills and learn more advanced skills. The grants may be used to initiate or expand compensatory education programs for secondary school students or dropouts, transition-to-work activities in cooperation with the private sector or community-based organization, and use of secondary students as tutors of other educationally disadvantaged pupils. The fiscal year 1989 authorization for this program was $200 million; however, no funds were appropriated for the program. In fiscal year 1990, the first year of funding, just under $5 million was appropriated for the program (202b). According to the U.S. Department of Education, basic skills programs can continue to be carried out through Chapter 1 basic and concentration grants and the School Dropout Demonstration Assistance Act.

  —Title I, Chapter 1, part C established a longer term formula grant program of State grants to secondary schools for basic skills improvement plus dropout prevention and reentry. In general, funds will be allocated to States in proportion to the Chapter 1 basic grants their schools receive.[23]

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[19] The Hawkins-Stafford Act authorized on a demonstration basis, in the Even Start program, support for projects that provide basic education for both educationally disadvantaged children ages 1 through 7 and their parents who reside in areas of relatively high poverty concentration. This program is intended to provide general basic education to parents and to increase their involvement in helping to instruct their children (202a). It may have the potential to benefit adolescent parents.

[20] At least nine other U.S. Department of Education programs and three U.S. Department of Labor programs may help schools that have dropout programs. For information about these programs, which range from large grant programs (e.g., Chapter 1 and the Job Training Partnership Act programs) to small programs explicitly focused on helping students complete school, see the March 1990 Congressional Research Service issue brief entitled ''High School Dropouts: Current Federal Programs'' (202b). That publication notes that little is known about the extent to which the available programs actually help students complete school (202b). It also notes that because the fragmentation of programs may be confusing to organizations working with dropouts, greater coordination may be desirable. OTA's discussion of the general problem of fragmentation in Federal programs for adolescents is presented in ch. 19, ''The Role of Federal Agencies in Adolescent Health,'' in Vol. III of this Report.

[21] Title VI also required the Secretary of Education to establish a standard definition of the term ''school dropout.'' Such a definition was published in the Federal Register on May 10, 1988, p. 16667 (202a).

[22] As of March 1990, fiscal year 1988 and 1989 appropriations for the School Dropout Demonstration Assistance Act had provided 2 years of assistance to 89 projects in 31 States and the District of Columbia (202b). Evaluations were not yet available.

[23] All of these changes are discussed at length in a January 1989 Congressional Research Service report entitled ''Education for Disadvantaged Children: Major Themes in the 1988 Reauthorization of Chapter 1'' (202a).

U.S. Department of Labor

Within the U.S. Department of Labor, the Employment and Training Administration is the agency most directly supporting activities affecting adolescents. In program year 1989, funding for youth was estimated to account for 58 percent ($2.2 billion) of the budget. Employment and Training Administration projects for youth typically focus on adolescents and young adults ages 16 and over. The Employment and Training Administration supports employment and training programs for economically disadvantaged youth under the 1982 Job Training Partnership Act. Three programs authorized under Titles II-A, II-B, and IV of the Job Partnership Training Act support the provision of services to high school dropouts and potential dropouts ages 14 or 16 to 21 (202b).

Title II-A provides training grants for disadvantaged adults and youth to States, which pass on 78 percent of the funds to local service delivery areas for training of people who are economically disadvantaged or face other barriers to employment (e.g., lack of a high school diploma) (202b). Local service delivery areas must spend 40 percent of the funds for youth ages 16 to 21. States must use a portion of their education set-aside (8 percent of the total grant) for literacy training, dropout prevention, and school-to-work transition programs. The fiscal year 1990 appropriation for Title II-A was $1.7 billion.

Title II-B provides Summer Youth Employment and Training grants for low-income youth to States, which pass on funds to service delivery areas for summer on-the-job training, work experience, and supportive services for disadvantaged youth ages 16 to 21 (202b). At local option, 14- and 15-year-olds may also be served. Local service delivery areas' plans must include assessments of participants' reading and math skills and describe available remedial education activities. The fiscal year 1990 appropriation was $699 million.

Title IV authorizes various federally administered programs affecting adolescents, such as Job Corps and programs designed for Native Americans and migrant workers (202b). Job Corps, a joint venture between the U.S. Department of Labor, private corporations, and nonprofit organizations, provides employment and training in primarily residential centers for severely disadvantaged adolescents and young adults ages 16 to 21. The U.S. Department of Labor provides funding for the centers, which totaled $741.8 million in program year 1989, and corporations and nonprofit organizations organize and manage the centers under a contractual agreement. In program year 1989, there were 100,000 participants in Job Corps. After completing the program, 66.9 percent of the participants were placed in jobs and 16.7 percent went on for further education.

Title IV also establishes funding for research, which is administered by the Division of Research and Demonstrations in the Office of Strategic Planning and Policy Development. One of the primary goals is to address the problem of unemployed youth or those at risk of becoming unemployed. Specific programs include grants to integrate Federal, State, and local services; to investigate patterns of youth achievement; to link school and employment with apprenticeships; to evaluate demonstrations providing alternative education to at-risk youth; and to analyze interagency demonstrations. In one recent year, there were 35 such research projects underway, and the average cost per project was approximately $275,000.

Under the Employment and Training Administration's Office of Work-Based Learning, the Bureau of Apprenticeship and Training administers various apprenticeship programs authorized by the National Apprenticeship Act of 1937. Federal staff from the Bureau of Apprenticeship and Training, as well as State personnel in some States, assist in providing technical assistance to the apprenticeship programs, which are sponsored by industry. The average age of most apprentices is about 29, and about 17 percent of apprentices are between the ages of 16 and 22. There is one type of apprenticeship program designed specifically for adolescents. The School-to-Apprenticeship Program, which makes up less than 1 percent of all apprenticeship programs, provides adolescents with the opportunity to attain valuable job skills in an apprenticeship when they are high school seniors (101).

Adolescents' Discretionary Time[24]

Neither researchers, policymakers, nor even parents know a great deal about how U.S. adolescents use their time when they are not in school or engaged in basic maintenance activities (e.g., eating, sleeping). A number of questions remain to be answered. For instance, how many hours per week do adolescents typically spend in discretionary activities? Where do they engage in such activities? With whom, if anyone, are such activities shared? Furthermore, does the use of adolescents' discretionary time vary by age, race, gender or other cultural, ethnic, or demographic factors?

Despite the paucity of systematic data on the topic, it is virtually certain that the physical, social, and behavioral development of U.S. adolescents is shaped, at least in part, by experiences that occur during their discretionary time. Hence, it is likely that the constructive and creative use of discretionary time will enhance adolescents' prospects for healthy development. Toward this end, future policies regarding adolescent development must be well informed by knowledge about the past, present, and potential uses of discretionary time.

Given the large amounts of time that adolescents devote to highly structured activities (such as schooling and homework) and essential maintenance activities (such as eating, sleeping, and personal hygiene), their *discretionary time probably constitutes the most abundant and flexible resource that exists for the provision of health-enhancing programs*. Studies have shown that recreational and leisure activities, as well as work activities, can provide adolescents with opportunities for experiences of mastery and competency (103); creativity and self-expression (50); self-improvement and self-definition (125); self-fulfillment and personal meaning (50); enhancement of character and personality (103); testing oneself in competition (106); development of interpersonal and social skills (103); and, the development of autonomy (50). Leisure and work activities also can contribute to social experimentation and recognition (125); improved physical health (17); an increased sense of freedom (50); identification with positive role models and mentors (66); companionship and improved relationships with others (50); and, of course, entertainment and relaxation (132). Research has shown that leisure and work activities which involve the attainment of specific goals (59) and meaningful goal-directed activity (65,129) are positively related to important developmental variables such as self-esteem, positive affect, and life satisfaction.

For a number of reasons, U.S. adolescents today probably spend much less time with their parents and families than in previous years. The reasons include the breakdown of two-parent families due to separation and divorce (29,77); the deterioration of extended family relationships as a result of high rates of geographic mobility and urban migration (76); the rapid entry of mothers into the work force (216) and the concurrent emergence of numerous "latchkey" children who are unattended after school (192); high incidences of parental substance abuse and mental illness, and parents' attendant inability to exert positive socializing effects upon their children (68); decreased family size and, therefore, fewer siblings who are available to socialize youngsters (16,29); and, fiscal exigencies which constrain the availability of funds for after-school programs (128).

According to some observers, U.S. adolescents have become increasingly separated from adults, have fewer adult responsibilities, and communicate less frequently with adults. Indeed, one study indicates that relatively few adolescents ask their parents for advice about such basic concerns as jobs, college, school problems, sibling problems, health or diet, drinking, sex, trouble with other adolescents, and drugs (154). To the extent that adolescents spend less time with their parents, their development is likely to be shaped less frequently and less influentially by parents and more often by peers or others with whom adolescents come into contact during their "free" time or by parental surrogates and role models who appear on television or elsewhere. Some observers suggest that the relative isolation of adolescents from adults has helped to bring about "adolescent rolelessness" (153). Others contend that adolescents' insulation from "the real business of life" produces apathy, self-hatred, boredom, loneliness, meaninglessness, and acute feelings of frustration (46).

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[24] This section draws substantially from a paper entitled "How Can Society Contribute to Meaningful Use of Adolescents' Spare Time," prepared under contract to OTA by Ronald Feldman (66a).

Given the central role of discretionary time in adolescent growth and development, it is unfortunate that relevant research concerning this topic is very limited. Such research is essential to better comprehend how adolescents use their discretionary time and how we can devise appropriate policies and programs to promote health-enhancing uses of discretionary time.

How Do U.S. Adolescents Spend Their Time?

Results from the Monitoring the Future/High School Seniors Survey, which surveyed a nationally representative sample of about 17,000 U.S. high school seniors, indicate that U.S. adolescents consider discretionary and leisure activities to be of great importance (8). Seventy percent of the high school seniors who were interviewed in 1986 stated that it was either "extremely important" or "quite important" to have "plenty of time" for recreation and hobbies. This was the highest[25] percentage reported in the survey's 10-year history. In considering the attributes of preferred jobs, 78 percent of the 1986 high school seniors regarded more than 2 weeks of vacation as "pretty important" or "very important," while 83 percent deemed it "pretty important" or "very important" that their job afford "a lot of time for other things in life." Both figures were higher than at any other time in the survey's history.

A review by Easterlin and Crimmins further substantiates that a significant shift has emerged in the leisure aspirations of American adolescents during the decade from 1976 to 1986 (55). Among 14 life goals studied, the goal with the greatest increase in importance to adolescents in the decade from 1976 to 1986 was "having lots of money." The 1986 adolescent respondents considered it much more important than their counterparts a decade earlier to own such items as a vacation house, at least two cars, and a recreational vehicle. Although in both 1976 and 1986 these goals were exceeded in importance by other goals, including "a good marriage and family life," the foregoing goals rose most in importance and were integrally related to high valuations of leisure time.

Table 4-5—Where Adolescents Spend Their Time[a]

Home (41%)	
Bedroom	12.9%
Living room	8.9
Kitchen	8.1
Yard or garage	4.1
Dining room	3.3
Basement	2.2
Bathroom	1.6
School (32%)	
Classroom	19.8
Miscellaneous locations	2.3
Cafeteria	2.2
Halls	2.0
Gym	1.9
Student center	1.3
Library	1.2
School grounds	0.8
Public (27%)	
Friends' home	5.4
At work	5.3
Automobile	3.8
Other public areas	3.0
Store or cafe	2.8
Street	2.0
Park	1.7
Walking	1.5
Indoor recreational facility	0.8
Church	0.8
Bus or train	0.4

[a] The data shown in this table were derived from a study of 75 adolescents who for a 1-week period carried an electronic pager and were buzzed frequently during the day and asked to record their activities (see text). The data here are based upon 2,734 weighted self-reports. Each percentage point is equivalent to approximately 1 hour per week spent in the given location or activity.

SOURCE: Adapted from M. Csikszentmihalyi and R. Larson, *Being Adolescent: Conflict and Growth in the Teenage Years* (New York, NY: Basic Books, 1984).

Perhaps the most systematic study of American adolescents' use of time was a study by Cziksentmihalyi and Larson published in 1984 (44). These investigators utilized an innovative research procedure in which 75 adolescents were asked to carry an electronic pager and a pad of self-report forms for 1 week. At a random moment within every 2-hour period, a signal was sent to the pager and the adolescent was instructed to complete a self-report form about his or her activity at that time. Despite sampling limitations, this study did provide an overview of 75 adolescents' daily experience.

As shown in table 4-5, the investigators found that the sampled adolescents spent 41 percent of their time at home, 32 percent at school, and 27 percent in locations such as friends' homes, work or parks (44). Much (nearly 40 percent) of the time these adolescents spent at school was spent in places other than

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[25] Lest it be thought that placing a high value on leisure time means that contemporary adolescents are lazier now than they were in past, it is important to compare adolescents' attitudes towards leisure time to those of adults. A survey recently reported in the *Washington Post* found that many private sector executives considered vacations crucial to their psychological and physical well-being (215a).

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the classroom (e.g., miscellaneous locations, cafeteria, halls, gym). Time spent in these locations frequently afforded opportunities for unstructured social interaction with peers.

As shown in table 4-6, the sampled adolescents spent 40 percent of their time in discretionary activities such as socializing, watching television, reading, and engaging in sports or games (44). They spent approximately 31 percent of their time in daily maintenance activities such as chores, errands, eating, traveling from one place to another, sleeping, and personal care (e.g., grooming, dressing and bathing). Finally, they spent 29 percent of their time in activities that the investigators characterized as "productive," primarily studying, classwork, or jobs and related activities. Even though the sampled adolescents devoted more time to self-selected discretionary activities than to maintenance or productive activities, it is probable that the researchers' estimates of the subjects' discretionary time are low. The reason is that data were not collected during such prime leisure periods as Sundays, weekdays after 11 p.m., and the summer.

If one considers the sampled adolescents' leisure time (see table 4-6), one finds that the greatest proportion of this was spent in socializing; the adolescents spent one-sixth of their waking hours socializing. In addition, the sampled adolescents reported engaging in conversation while studying, watching television, and eating. In total, therefore, the sampled adolescents probably spent about one-third of their day conversing with others. Hence, conversation was by far the single most prevalent activity in the sampled adolescents' lives. The next largest amount of leisure time, after that spent socializing, was spent in watching television. The sampled adolescents spent much smaller proportions of their leisure time in essentially solitary activities such as reading, thinking, and listening to music or in activities that typically involve friends and peers such as sports and games or arts and hobbies. Altogether, more than one-half of the adolescents' discretionary time was spent in social interaction with others and in activities that adults often consider to be of secondary importance. In terms of sheer amount of time, peers were by far the greatest presence in the sampled adolescents' lives.

Table 4-6—What Adolescents Spend Their Time Doing[a]

Leisure activities (40%)	
Socializing	16.0%
Watching television	7.2
Miscellaneous	4.6
Reading (nonschool)	3.5
Sports and games	3.4
Thinking	2.4
Arts and hobbies	1.5
Listening to music	1.4
Maintenance activities (31%)	
Chores and errands	14.3
Eating	5.6
Transportation	4.9
Rest and napping	3.2
Personal care	3.2
Productive activities (29%)	
Studying	12.7
Classwork	12.0
Jobs and other activities	4.3

[a] The data in this table were derived from a study of 75 adolescents who for a 1-week period carried an electronic pager and were buzzed frequently during the day and asked to record their activities (see text).

SOURCE: Adapted from M. Csikszentmihalyi and R. Larson, *Being Adolescent: Conflict and Growth in the Teenage Years* (New York, NY: Basic Books, 1984).

In the late 1970s, Farley conducted a related study with 129 Canadian adolescents who ranged between 10 and 17 years of age (60). Information regarding the daily activities of 129 adolescents was collected by recall of a sequential record of every activity that lasted at least 15 minutes. Aside from weekday school attendance, passive leisure was the activity grouping that clearly emerged as the most widespread on both weekdays and Sundays. Nearly 90 percent of the adolescents devoted some time each day to passive leisure activities. On the average, the adolescents in this study spent 2 to 3 hours per day passively. Nearly three-quarters of this time was accounted for by television watching. Low levels of participation were recorded for such activities as working away from home, cultural or educational activities, and organizational activities. Only 18 percent of the respondents participated in adolescent organizations, and an even lower percentage (12 percent) took part in church activities. Nevertheless, 100 percent of the subjects who participated in adolescent organizations or church activities regarded these organizations as "important" or "very important."

Related research further supports the observation that a great deal of American adolescents' time is spent watching television. Some studies indicate that more than 70 percent of U.S. adolescents watch television daily (105) and that adolescents spend up to 25 hours per week watching television (145,191). Hispanic adolescents may watch television for as many as 30 hours per week (87). Home-based video games and televised music videos are of increasing interest to American adolescents (42,135). While some critics regard these leisure time activities as an "addiction" (189), the effects of such activities depend upon a wide range of variables such as the extent of peer and parental involvement and the substantive content of the videos. Rigorous research concerning the effects of these activities is virtually nonexistent.

Schneller conducted a 1988 study of adolescents' discretionary activity based on diaries logged every half hour from the close of school until bedtime (179). This study found a negative correlation between television viewing and activities such as participation in social or cultural events, adolescent movement activities, excursions, and outdoor games. Selnow and Reynolds' 1984 study of 184 sixth, seventh, and eighth graders similarly found a negative correlation between television viewing and membership in school, church, and musical groups (182). The authors concluded that extensive television viewing entails "opportunity costs" that preclude other forms of valuable activity. Adolescents who view greater amounts of television are less likely to take advantage of the social learning opportunities that can be provided by group membership.

The optimum amount of solitary activity is likely to vary in accord with the unique needs of each adolescent. For more mature adolescents, increased time alone generally is associated with better adjustment. Although some adolescents do not regard the experience of being alone as particularly pleasant, those who spend at least a moderate amount of time alone—that is, about 30 percent of their waking hours—appear to be better adjusted than others (108). Hence, being alone for reasonable periods of time may serve a constructive developmental function for adolescents (42,115).

In comparison with younger children, adolescents tend more often to be alone or with peers during the after-school hours (192). Some studies have shown that adolescents spend up to 10 hours per week at video arcades (149) and shopping malls (4).[26] As children are increasingly left to fend for themselves, parents fear about their children's safety (62). Among other things, they express concern about after-school injuries, excessive television viewing, being kidnapped, and sexual abuse (98). Concurrently, they worry that their adolescent children may not be utilizing their discretionary time in a way which contributes to more effective social, emotional, and behavioral development.

Alternatives for the Constructive Use of Adolescents' Discretionary Time

As discussed elsewhere in this Report,[27] since at least the early 1900s, a number of extrafamilial youth-serving agencies and, to some extent, other entities (e.g., schools, municipal recreation centers) have developed to enhance adolescents' access to health-enhancing alternatives for occupying their discretionary time. Just as there has been little systematic research on how, where, why, and with whom adolescents spend their discretionary time, there has been little systematic research into the nature, quality, and effectiveness of existing alternatives for the constructive use of adolescents' discretionary time. Nonetheless, as discussed below, many of these entities have attempted to base their programs on research on adolescent development and the prevention of problem behavior. Views on the basic requirements of programs to promote healthy adolescent development are discussed below, as are several typical programs and, when available, evaluations of their effectiveness. Perhaps because adolescents' discretionary time has not been a central focus of research or policy development, several issues about the nature of these alternatives have yet to be resolved. These issues are raised in the next section of this chapter.

Basic Requirements of Alternatives for the Constructive Use of Adolescents' Discretionary Time

According to Kerewsky and Lefstein, a number of factors are of particular importance in the design of effective and developmentally appropriate programs for adolescents (107).[28] Such factors include self-exploration and definition, meaningful participation, positive interaction with peers and adults, physical activity, competence and achievement, and structure and clear limits. Kerewsky and Lefstein suggest that effective programs for adolescents ought to be characterized by the following "nonnegotiable" criteria: they must have a clearly defined mission; be responsible to the local community; be safe and clean; and be caring, enjoyable and supervised. Moreover, they must meet at least once weekly in the after-school hours, be locally based, and be available during vacations. Several other criteria are regarded by Kerewsky and Lefstein as "negotiable"—that is, desirable under ideal circumstances but hardly expected in all instances (107). Specifically, programs should be accessible both physically and financially; include parent participation and provide in-service training for staff; and have a means of assessing the results. And, to the extent possible, programs should not overlap with local organizations and should proceed upon the basis of interagency collaboration. A variety of adolescent programs meet many, if not all, of these criteria.

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[26] Substance abuse problems among U.S. adolescents are discussed in ch. 12, "Alcohol, Tobacco, and Drug Abuse: Prevention and Services," in this volume.

[27] See ch. 2, "What Is Adolescent Health?" in this volume.

[28] Current understandings of the developmental needs of adolescents are discussed in ch. 2, "What Is Adolescent Health?" in this volume.

Lefstein and Lipsitz assert that appropriate and effective program alternatives for adolescents must take place in environments that offer realistic expectations for adolescents, caring relationships with adults, and diverse opportunities for constructive and enjoyable activities with peers (120).

Costello suggests that adolescents must acquire four important capacities that are essential for well-functioning adults: 1) physical vitality, 2) the ability to sustain caring relationships, 3) resourcefulness, and 4) social connectedness (41). Toward these ends, adolescent development programs should enable adolescents to engage in physical and mental activities which are adequate to accomplishing the tasks of everyday life. They should promote adolescents' sense of self-worth and the well-being of others in the family and the community. They should promote adolescents' ability to seek and sift information, apply practical knowledge, and improve one's cognitive and social skills. And, they ought to strengthen adolescents' sense of affiliation with a social community, which validates the adolescents' personal identity, provides support and services, and requires contributions in turn.

The available literature suggests the efficacy of basing program design efforts on a developmental perspective regarding adolescents (66a). Adolescents mature at varying rates. Both developmental and programmatic needs may differ considerably in accord with such factors as the participants' gender, race, socioeconomic status, and ethnicity (107). Moreover, the quantity, quality, and operational features of programs for adolescents can be expected to vary in accord with the nature of the respective communities in which they are located. The accessibility and utility of adolescent development programs necessarily are shaped by such factors as the community's financial resources, geographic location, and demographic composition.

The available literature reveals many ways for American adolescents to spend their discretionary time. These may be either formally organized, informally organized, or unorganized (66a). Several types of programs are discussed further below.

Youth-Serving Organizations

Many youth-serving programs are sponsored by national organizations that are funded primarily by the independent sector. One tabulation indicates that more than 300 national youth organizations operate with chapters of varying size throughout the United States (61). Two of the largest national organizations are the Boy Scouts and the 4-H Clubs, each with a membership of over four million youth in 1986. The membership in these and seven other major youth organizations (Girl Scouts of America, Boys and Girls Clubs, Young Men's and Young Women's Christian Association, Camp Fire, and Salvation Army) totaled 17 million in 1980, representing over one-third of all elementary and high-school age youths (113).

Long established agencies dominate the adolescent service field. In 1983, for example, the Boy Scouts of America had a 1983 membership equal to 15.9 percent of all American males 7 through 16 years of age (19). Between 1972 and 1983, however, the number of Scouts and Explorers in the organization declined by 22 percent, from 2,405,220 youth to 1,867,982 (19). From 1984 through 1988, by contrast, some youth organizations experienced increases in membership—e.g., the Boys Clubs[29] (+2 percent), Girl Scouts (+8 percent), Boy Scouts (+16 percent), Girls Clubs[30] (+25 percent), and Camp Fire (+48 percent). Concurrently, however, there was a decline in the youth membership of the YMCA and YWCA (60).

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[29] In order to more accurately reflect its membership, the Boys Clubs of America recently changes its name to the Boys and Girls Clubs of America.

In recent years, the Boy Scouts, Girl Scouts, the Salvation Army, and related organizations have progressed substantially beyond their original missions. They have established a variety of new programs including after-school programs for latchkey children, problem-solving programs for minority youths, and programs that help parents to promote ethical decisionmaking on the part of their children. Some organizations have devised highly targeted programs for special populations such as runaways and neglected or abused adolescents.

Within the private sector, the Boys and Girls Clubs of America is the major nationwide organization with a primary focus on direct service for disadvantaged youths. In 1983, the Boys Clubs served about 1.2 million youth (20). Of these, 61 percent ranged in age from 11 to 18 years, 75 percent were from families with annual incomes under $12,000, 30 percent from families that receive public assistance, 51 percent from minority families, and 46 percent from single-parent households (20). Data from 1988 indicate that the membership of the Boys and Girls Clubs of America has remained stable with 1.285 million members at 1,100 facilities across the Nation (21). However, the proportion of 11- to-18-year-old members declined from 61 percent in 1983 to 53 percent in 1988.

Boys and Girls Clubs' programs focus on a broad range of concerns including citizenship and leadership development, health and fitness, adolescent employment, delinquency prevention, and the promotion of talent in sports and the arts. The Boys and Girls Clubs have developed curricula for youth programs in a number of areas, including health promotion, delinquency prevention, adolescent employment, citizen and leadership development, alcohol abuse prevention, and education for family life.

The Girls Clubs of America (now Girls Inc.) experienced an increase in membership from 200,000 in 1984 to 250,000 in 1988 (81). It also experienced in increase during the same period in the proportion of black, Hispanic, and Asian members (from 44 percent to 50 percent). However, only 29 percent of Girls Club members range in age from 12 to 18 years (81). Among the Girls Clubs' innovative programs are AIDS education, a pregnancy prevention programs, Friendly PEERsuasion (a program for substance abuse prevention), and Operation SMART (science, math, and relevant technology).

As Wynn and colleagues have noted, adolescents can participate in a wide range of programs offered by independent sector organizations. There are career groups such as Junior Achievement; character-building organizations such as the Boy Scouts; political groups like Young Democrats and Young Republicans; veterans' organizations such as the Sons of the Veterans of Foreign Wars; hobby groups such as Junior Philatelists of America; and, ethnic groups like the Ukranian Youth Organization and Indian Youth of America (205). In the absence of adequate surveys, however, few systematic data are available regarding the total number of adolescents who participate in privately supported youth organizations. It is especially difficult to ascertain the membership of such private organizations as high school fraternities, sororities, and local social clubs.

A number of studies have reported beneficial effects as a result of program participation in national youth-serving organizations. In 1987, Ladewig and Thomas found, for instance, that former 4-H members attained higher levels of education than nonparticipants and, as adults, were more likely to be involved in civic activities and political organizations (114). Likewise, a large-scale survey of high school seniors by Hanks found that adolescents' participation in voluntary organizations was related to subsequent voting behavior and involvement in political campaigns (92).

Community Service Programs

Approximately 4,000 adolescent community service programs are in existence in the United States (181). The programs include more than 50 full-time youth service corps, 550 campus-based service programs, 3,000 school-based service programs, at least 50 service corps and programs that are organized by local communities, and Federal service programs overseen by ACTION.

Cities are particularly active sponsors of youth service programs. Thus, for instance, the City

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[30] Girls Clubs of America is now known as Girls Inc.

Volunteer Corps of New York City (CVC), with an annual $8 million budget, has pioneered volunteer efforts in human service delivery. It has established a program for high school adolescents who work full-time in the summer and part-time during the school year. In 1988, CVC instituted a small program for students already in college, offering summer stipends and bonuses for one and two semesters of part-time Corps work. About 600 CVC volunteers work on projects in city parks, building rehabilitation, centers for retarded adults, nursing homes, and schools. Every 3 months, the participants change projects so that they can have a variety of environmental and human service work experiences during a 1-year period. CVC also offers completion incentives: $2500 for those who complete 1 year of service, or $5000 toward college for those who choose to resume their studies (210).

Adolescents who participate in community service programs can obtain a variety of benefits. A survey of a random sample of participants in projects sponsored by young volunteers overseen by the Federal program ACTION found that the young participants intended to continue volunteer service both in school and as adults and, also, that they would encourage others to volunteer (2). Moreover, adolescent participants have reported gains in understanding community service, ability to work with others, development of career objectives, willingness to learn, and reduced need for supervision. Calabrese and Schumer's study of ninth grade participants in a 20-week school community service program showed reduced levels of alienation, isolation, and discipline problems (26). Likewise, in a study of 11- to-17-year-old volunteers in community improvement projects, Hamilton and Fenzel found that participants developed positive attitudes toward social responsibility for needy people and a commitment toward continued volunteer work (90). Participants also developed vocational and interpersonal skills and gained greater knowledge of themselves and others.

School-Based Programs

Schools typically are accessible and often-used sites for adolescent development and adolescent service activities. Peer counseling and peer tutoring programs are among the most successful and visible programs that have been offered in schools. Such programs often are reported to yield a wide range of benefits both for the tutees and the tutors (48,80, 111,116). Reported benefits include gains in tests of ego and moral development (32). Adolescents in such programs have been employed as counselors (49), trainers (126), therapists for the remediation of behavior disorders (33), and peer mediators. In one New York City school, administrators reported that a peer mediation program cut the suspension rate in half (52).

Many school-based programs address adolescent problems primarily on a reactive basis, but some school systems also have initiated a wide range of community service programs that are essentially proactive and preventive in nature. Following extensive deliberations, the Carnegie Council on Adolescent Development recommended that adolescent community service be part of the core program in middle school education (27). The Carnegie Council on Adolescent Development observed that students can volunteer to work in such diverse settings as senior citizen centers, nursing homes, soup kitchens, child care centers, parks, and environmental centers. Assistance for such programs can be provided by institutions of higher education. The Early Adolescent Helper Program of the City University of New York, for example, has involved hundreds of students from 17 New York City middle and junior high schools in educational enrichment and adolescent service activities (27).

Significant benefits for adolescents have been identified by many studies of school-based programs. Thus, Conrad and Hedin's study of 4,000 students in experiential educational programs reported that the students showed improvements in self-esteem, moral reasoning, personal and social development, attitudes toward adults, and involvement in the community (36). Similarly, Hanks and Eckland's study of 1,627 high school sophomores found that participation in school-based extracurricular activities is associated with later educational attainment and with participation in adult voluntary organizations (93). Related studies have shown participation in extracurricular activities to be associated with higher educational goals (190), subsequent educational attainment (159), occupational attainment and income (160), and participation in voluntary organizations and the political process (161). The studies do not allow any firm conclusions about causality.

Photo credit: Ron Larson/Youth Service America

Some studies suggest that participation in extracurricular activities can keep adolescents in school and enhance their academic progress.

Municipal Recreation Centers

Numerous adolescent development programs have been established at municipal recreation centers throughout the Nation.

As noted by Lefstein and Lipstiz, for example, the Arlington County (Virginia) Recreation Division operates neighborhood centers that offer planned activities and drop-in programs for adolescents (120). A Junior Jamboree program is conducted on alternate Saturdays which offers arts and crafts, sports, cooking, field trips, and health information for 12- to 15-year-olds (120).

Similarly, the Concord (California) Recreation and Human Services Division has created a Department of Leisure Services which operates a city-wide recreation program at elementary schools, intermediate schools, high schools, and local community centers (120). The Department of Leisure Services has established a variety of adolescent Services Target Programs for low-income neighborhoods where parents cannot afford to pay for special out-of-school activities for their children. Besides offering an extensive array of games, sports, and special interest classes, the program seeks to help the participants to build social skills and to experience a world other than their own impoverished neighborhoods by means of parties, excursions out of the neighborhood, and other events. After 1 year of programming that included recreation, counseling, and employment, juvenile crime decreased in three target neighborhoods by 31 percent, 63 percent, and 69 percent, respectively (120).

A unique collaborative program with the private sector has been established by the East Oakland (California) Youth Development Center (120). The center sponsors a comprehensive program that offers job skills development, basic skills tutoring, counseling, and recreation. Over 1,000 adolescents ranging in age from 10 to 21 years are registered as members (120). While the City of Oakland invested $350,000 in community development funds toward initiation of the program, the Youth Development Center was launched largely by means of an aggressive fundraising campaign conducted by the Community Affairs Department of the Clorox Company. The Clorox Company contributed $247,000 toward construction of the center, pledged $50,000 annually for program operation, and initiated an endowment campaign aimed at matching the company's own gift of $1.5 million. Since the Center opened, 25 foundations and more than 70 corporations have contributed funds for its operation (120).

Churches and Synagogues

There is a great need for ample and diverse family-based activities that are attractive to adolescents. Churches and synagogues are among the foremost institutions that can offer such activities on a regular basis.

Some of the most extensive family-oriented programs have been devised by the Church of Jesus Christ of Latter Day Saints (Mormons) (197). The Mormon church promotes "wholesome recreation" as a part of its religious creed by setting aside 1 weekday evening as a "Family Activity Night" (197). Families are free to choose the activity that they desire but are encouraged to engage in varied and challenging activities that appeal to all age groups. The church makes available a comprehensive *Family Resource Manual* which identifies family enrichment activities (e.g., first aid, food storage, and home repairs) as well as physical, cultural, social and intellectual activities. Each church parish has a small activities committee that helps families to develop their own activities. Information about exemplary programs is disseminated to other such committees on a yearly basis.

Churches and synagogues also have sponsored a wide range of community service programs (120) and family camps for parents and their children.

Some of these have introduced programming that teaches or reinforces selected family and societal values (96), while others have concentrated on sports, skills development, or cultural and educational learning such as was introduced by the Chautauqua movement (58).

Other Alternatives

Various innovative alternatives for the constructive use of adolescents' discretionary time have been developed by a wide range of agencies at the national, regional, and local levels.

One innovative alternative is a family recreation program, known as "Together Is Better," that has been introduced nationally by the Canadian Parks and Recreation Association (95). This program emphasizes a high degree of interaction among family members. Examples include family picnics, group hikes, and family games. Information kits about activities such as kite-making, backyard camping, hiking, and tracing family trees are distributed nationally. A major marketing campaign gives the overall program a central focus and creates high visibility.

The U.S. Air Force's Community Action Program sponsored a Youth Services Camping Program for boys in the State of Michigan, that brought together 590 14- to 17-year-old low achievers, predelinquents, expelled or suspended students, and wards of the court (201). The Youth Services Camping Program emphasized vocational opportunities, health care, recreation, fellowship and leadership. The behaviors and self-concepts of all categories of the boys participating improved substantially (201). A suburban community center achieved similar results by integrating small numbers of antisocial adolescents into activity groups with prosocial adolescents (67). Innovative adolescent development programming can occur at community centers and neighborhood agencies sponsored by religious organizations, fraternal associations and other groups. Revitalized efforts at these sites and others can capitalize upon major adolescent development resources that have been underutilized in recent decades.

Public libraries are important, but often overlooked, sites for adolescent development programs. Some libraries offer creative opportunities for adolescents to provide support across generations including service as storytellers for young children and as "computer tutors" for children and adults (172). They also offer programs for consolidating academic and reading skills, learning practical life skills such as budget planning and hunting safety, and exploring social or emotional issues that are relevant to adolescence (215).

Finally, paid jobs constitute an important resource for the constructive use of adolescents' discretionary time (3). As are other alternatives, paid jobs are likely to be most beneficial when they engage adolescents in meaningful tasks, bring them into regular contact with adults and responsible peers, and provide fair and adequate remuneration for the services that are provided (183). Special care must be taken to ensure that adolescents do not devote excessive amounts of time to paid jobs and thereby forgo opportunities to keep up with their schoolwork or to take part in other growth-enhancing activities with their peers and family (193).

Major Issues in the Elaboration of Health-Enhancing Alternatives for the Use of Adolescents' Discretionary Time

A number of major issues must be addressed if significant improvements are to be made in the quantity, quality, and diversity of health-enhancing alternatives for America's adolescents. These pertain both to key barriers that impede the development of innovative programs and to a variety of unanswered questions that must be resolved, at least in part, if significant advances are to be made.

Counterproductive Theories of Adolescent Development

Adolescent services, and the misperceptions upon which they often are based, have evolved largely from theories of adolescent deviance (199). These formulations view adolescents, particularly those from low-income households, as essentially deviant or potentially deviant. From this standpoint, adults must guide adolescents along a fairly narrow path toward adulthood and they must correct and constrain those who stray. Given the prevalence of this perspective, programs are most likely to be funded when they can claim the capacity to combat a particular deviancy such as drug use, vandalism, or delinquency. Proactive and preventive programs are less likely to attract the financial support that they deserve.

Correspondingly, agencies that serve adolescents sometimes tend to overreact to incidents of adolescent deviance that are depicted by the mass media. This can lead them to emphasize programs that are essentially reactive rather than proactive. It also reinforces the stereotype of "adolescents as deviants" on the part of the public, policymakers, and the adolescent service community. The result is a highly fragmented service delivery system, increased barriers to the elaboration of holistic service delivery programs, and heightened activity by entrepreneurial agencies that may design their programs more to reflect the availability of pubiic funds than the serious needs of the community.

Categorical Funding Sources

The specialized funding that has been promoted by single-purpose advocacy groups, legislative committee systems, and narrowly targeted adolescent service bureaucracies make the delivery of comprehensive adolescent services all but impossible. The ability of both public and private agencies to plan coherent adolescent services is often undermined by the rigidity of Federal, State, and local categorical funding requirements and by the tendency to formulate narrowly targeted contracts in response to specific problems that come to the public's awareness (135). Legislative committee systems used to formulate public policies and programs often tend to conceptualize adolescents categorically as drug-users, runaways, adolescents in need of job training, or in terms of similarly constraining definitions that overlook the fact that a single adolescent may have multiple needs.[31] In the real world, the same adolescent is often a dropout, a drug abuser, a mother or a father, in need of mental health care, and unemployable in the local labor market—a fact that politicians, grantmakers, service providers, and even families sometimes fail to recognize (51,199).

Categorical conceptualizations have led to the haphazard growth of specialized direct service agencies and provided little opportunity or incentive for programs to cooperate, coordinate, or engage in systematic long-term planning of comprehensive adolescent programs.

Another problem is that public and private funds for adolescent programs tend to be awarded on a short-term basis. But, when funds are doled out for only 1, 2, or 3 years at a time, it is virtually impossible to plan coherent long-term programs and to develop initiatives that seek to sustain or expand hard-won gains. It also is difficult to retain talented staff who may have more secure jobs waiting elsewhere. Inordinate staff attention must be directed constantly toward the acquisition of financial resources. A patchwork quilt aggregation of poorly interrelated and inadequately integrated programs may emerge from a myriad of funding sources. Moreover, counterproductive competition can occur on the part of agencies who might otherwise benefit from a collaborative and collegial relationship. Time spent in school and time spent in discretionary (nonschool, nonmaintenance) activities constitute large segments of an adolescent's life. Outside the family and home,[32] school buildings and personnel, and peers and adults in community settings (including the media) constitute important and influential environments for adolescents. This chapter reviewed shortcomings in many of these settings and ways in which these environments can be improved.

Public Support v. Private Support

A fundamental issue in the provision of adolescent development programs pertains to the optimum mix between public support and private support. Private auspices may be highly effective for the creation and sustenance of such programs. Yet there are communities that do not have the resources—whether in funds or in leadership—to support the development of an infrastructure which is sufficient to create and maintain an array of programs.

Key questions regarding this issue have been articulated by Wynn and colleagues (215). If the provision of community supports for adolescent development programs ought to be through voluntary efforts, where can resources be found to sustain them at an adequate level? Should a quasi-public corporation or organization be created to assist in stimulating and sustaining community support? Or, should government play a more active role in the provision of community supports? Might we actually need to create a social care and community

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[31] The problem of multiple committee jurisdictions in Congress and the fragmentation of Federal programs for adolescents is discussed in ch. 19, "The Role of Federal Agencies in Adolescent Health," in Vol. III.

[32] Parents and families' influences on adolescent health are reviewed in ch. 3, "Parents and Families' Influence on Adolescent Health," and elsewhere in this volume.

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support system like our educational system or health care system to foster the development of adolescent programs? How can government effectively support the informal, voluntary, and associational nature of many existing and potential forms of community support? And, would government bring with it rigid formulas or bureaucratic approaches that are antithetical to the existence of community supports?

An overview of Federal expenditures for children and adolescents indicates that only a scant portion of governmental resources is devoted to nonschool developmental programs.[33] In 1980, for instance, the greatest percentages of Federal outlays for children and adolescents were for income maintenance programs (35.5 percent), nutrition (19.4 percent), education (16.5 percent), health (8.4 percent), employment (6.4 percent), housing (5.3 percent), and community development (5.2 percent). A relatively small percentage was allocated for child care (2.4 percent), juvenile justice (0.6 percent), or recreation (0.3 percent). Moreover, U.S. Government expenditures for recreation declined steadily, from 0.5 percent of the domestic Federal budget in 1964 to only 0.3 percent in 1980 (34). In Britain, by contrast, youth work receives approximately 1.5 percent of the national budget (215). The scant attention directed toward recreation and leisure programs for U.S. adolescents is reflected at the State level as well as the Federal level. Of 56 States, territories, and the District of Columbia participating in the 1982 White House Conference on Children and Youth, only 6 treated recreation and leisure as a major concern in their statewide conferences (205).

New York City sponsors a Youth Bureau that is responsible for planning, implementing, and monitoring development and delinquency prevention programs for adolescents. The Youth Bureau contracts with community-based organizations to provide services for youth. The community-based programs with which the Youth Bureau contracts typically provide recreational, educational, counseling, cultural enrichment, and vocational services. There were 582 such contract agencies in fiscal year 1989 with a budget of $30.7 million (134). Altogether, the agency's budget averages less than $16 per adolescent in New York City.

Common Infrastructure v. Adolescents as a Special Case

A strong case can be made for the provision of special funding and program initiatives designed expressly for adolescents. Indeed, a sound investment in adolescent development programs can be expected to yield highly beneficial long-term outcomes for society as a whole. Adolescents who are properly challenged, motivated, and trained are likely to develop into mature and responsible parents, breadwinners, and citizens.

Nevertheless, alternative strategies for funding and program development also can be considered. It has been suggested, for instance, that programs can be devised which are based upon the common needs of varying at-risk populations. By this formulation, the provision of community supports can be thought of not as categorical responses to a separate and independent adolescent population but as ways in which communities can assist a broad range of individuals with common interests and needs (215). Thus, efforts to convey information about health and educational resources, provide transportation services for isolated or dependent individuals, or implement mutual assistance programs can be organized across age groups rather than by means of a single age category. Systematic study of the relative advantages and disadvantages of these approaches and others would be useful.

Adolescent Development, Recreation, or Employment?

In an era of limited resources, it is essential to ascertain what proportions of available funds can be allocated optimally to initiatives that aim, respectively, at adolescent development, recreation, employment, or other goals. The guidelines for this task will be determined largely by the particular subpopulations of adolescents under consideration. Thus, adolescents from economically impoverished families or neighborhoods may benefit relatively more than other adolescents from programs that offer job skills training or employment opportunities. Nevertheless, the goals of adolescent development, recreation, and employment need not be mutually exclusive. Many types of programs can progress toward all three objectives albeit in varying respects and at differing rates.

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[33] An overview of Federal expenditures on adolescents is presented in ch. 19, "The Role of Federal Agencies in Adolescent Health," in Vol. III.

Extent of Adult Involvement and Supervision

Adult involvement may be necessary in the design or supervision of especially complex or demanding programs and for programs that are geared primarily toward younger adolescents. To the extent possible, though, adolescents themselves should be actively engaged in the design and operation of their own programs. In some cases when adults are involved, professional training may be desirable. Such training may be particularly important for the design and implementation of programs that require extensive expertise in administration or for programs that serve large numbers of seriously disturbed adolescents. Graduate training in adolescent work and the related helping professions has proven beneficial in programs for such high-risk populations as antisocial adolescents (67) and adolescents whose parents are mentally ill (68). Clearly, however, adult volunteers can contribute safely and cost-effectively to the vast majority of programs that aim to promote health-enhancing activities on the part of adolescents. A more concerted effort to involve adult volunteers may be needed. Because some of the adolescents and institutions' volunteers may be dealing with may present serious obstacles, it will be important to provide appropriate support and referral networks to adult volunteers.

Differing Needs for Differing Adolescent Populations

Fairly little is known about the differing developmental needs of particular groups of adolescents. Patterns may or may not be similar in varying subcultures. Increased peer-group orientation and a growing interest in group activities during early and middle adolescence has been observed concurrently, for instance, in England (187), Australia (78), and the United States (67). Yet, a crosscultural study of school dropouts has shown that Australian and American adolescents who quit secondary school use their leisure time in different ways (15). Australian school leavers typically spend their extra time in sports and recreation. By contrast, American dropouts report more visiting, loafing, and problem behaviors. The investigators posit that these differences reflect the differential structuring of available activities for adolescents in the two societies rather than national differences in leisure preferences. They suggest further that some of the deleterious consequences that are presumed to follow from dropping out in America reflect the daily social experiences of dropouts in this country more than the act of quitting school.

Cultural and subcultural variations often are evident in the use of discretionary time by adolescents. Hispanic adolescents, for instance, devote more time than white non-Hispanic adolescents to television viewing (87). White adolescents are more likely to have paid jobs than black adolescents (66a). Yet these variations also may reflect such factors as the decreased availability of two-parent families for certain categories of adolescents, more dual-career couples, reduced employment opportunities, and diminished community availability of leisure alternatives such as public libraries, after-school programs, and for-profit or nonprofit youth service agencies. A study of Chicago neighborhoods has shown, for instance, that in areas where the median family income is below $25,000, the average number of children per each available public library is twice the number of children in areas with higher family income (196). More than twice as much money was spent per child on libraries in the more affluent neighborhoods.

Adolescent programs can profitably bring together adolescents from differing social, cultural and behavioral backgrounds. The most dramatic examples in this regard pertain to programs that integrate adolescents with behavioral problems into groups of "normal" peers in classroom or recreational settings (23,39,47,88,170,217). Peer-based "therapy" programs for adolescents typically have been regarded as failures when interventions were attempted solely in groups comprised of antisocial peers and at institutions denoted primarily as correctional or mental health settings (13,109,131,214). The latter tend to be unnecessarily stigmatizing. In contrast, experimental evidence suggests that antisocial adolescents are more likely to achieve behavioral gains when they are treated among prosocial peers and when the interventions are offered in nonstigmatizing environments such as community centers (67).

Adolescents' needs may also be different at different times of the day. OTA observes that more programs and facilities are available during the day, but not at night or on weekends when adolescents may have little to do. Some communities have set up Friday night dances, midnight basketball sessions, and the like, but these seem to be the exception rather than the rule. Often, administrative convenience rather than adolescent need seems to be the determining factor in program development.

National Youth Service

Since the days of the post-Depression Civilian Conservation Corps (CCC), there has been debate in this country concerning the desirability of a national youth service. The factors that are regarded as important to the success of the CCC ought perhaps to be considered as criteria for the evaluation of future proposals concerning a national youth service (57). First, the CCC was operated with a clear sense of purpose, namely, conservation work and economic support, as opposed to purely adolescent development objectives. Second, the CCC emphasized productivity. Third, many CCC projects were highly visible to surrounding communities and to the country at large. Fourth, local communities had a voice in projects undertaken by the CCC. And, fifth, each CCC camp made distinct contributions to the local economy.

New models of national youth service have been endorsed by groups such as The Commission on Work, Family and Citizenship of The William T. Grant Foundation (210), advocacy organizations such as the Coalition for National Service (56), and the public in general, who favor voluntary service by a ratio of better than seven to one (56).

Because of the size, visibility and vast impact of any form of national youth service, public acceptance of such an initiative will depend upon the answers to a variety of questions. These are likely to be based not only on economic considerations but on philosophical and political ones as well. To cite but a few: Should a national service program be mandatory or voluntary? Should it be in lieu of military service or in addition to it? Should it be during high school or afterwards? Should it offer economic incentives to the participants or not? What is the preferred length of service? Will participants necessarily replace employed adult workers? What should be the respective roles of federal and local authorities? And, what are the relative economic costs and benefits?

Few of these questions can be answered definitively. Yet, several key considerations are worth noting. With regard to financial costs and benefits, for example, a study of the California Conservation Corps by Public/Private Ventures estimates $1.34 in benefits for each dollar spent in the program (210). A second study suggests that the proportionate benefit is even higher, to wit, $1.60 in public benefit for each dollar spent by the Corps (210). The Job Corps has been similarly evaluated. Analyses have shown that the Job Corps increases earnings, enables its graduates to be employed longer, and helps many to go on to full-time study (210).

From 1934 through 1939, 90,000 acres of land in the Capitol Forest in Washington State was reforested by the CCC at an approximate cost $270,000 (101). In 1981, the acreage was harvested, and the timber value was placed conservatively at $7,000 per acre, or $630,000,000. Examples such as this dramatize not only the fact that significant financial benefits can accrue from large-scale youth service programs but also that planners and politicians must calculate their relative benefits on a long-term basis. They must act upon the same principles of "delayed gratification" that are regarded as so essential to the development of healthy adolescents.

Revitalization and Reinstitution of Social Service Agency Programs

In the past several decades, much of the Nation's organizational infrastructure for adolescent development programs has deteriorated. Traditional social service agencies such as neighborhood houses and community centers have increasingly relocated to affluent suburban areas; they have employed nonprofessional and volunteer personnel more readily than professionals; and they reduced the quantity and quality of their programs for adolescents (200). Nevertheless, neighborhood houses, community centers, and other social service agencies can constitute excellent settings for leisure and community service programs for adolescents of all ages. Many observers believe they may be more productive sites for helping high-risk adolescents than conventional types of treatment organizations (68). The developmental gains that are achieved by adolescents in such settings can be readily generalized to their natural environments and can be achieved on the basis of expenditures that may be as much as 80 percent lower than for comparable intervention programs in mental health or juvenile justice settings (67).

A significant revitalization of social service agencies would require a major infusion of Federal, State, and local support. Among other things, funds will be necessary to train professionals and volunteers and perhaps construct or renovate facilities in

Photo credit: Youth Service America

Revitalized social service agencies could work to develop volunteer opportunities that strengthen intergenerational connections among adolescents and adults from different social and economic backgrounds.

high-need areas. Revitalized social service agencies could explore new ways to involve adolescents in instrumental tasks as well as in purely recreational activities. They could sponsor nonprofit or for-profit adolescent-operated enterprises and can provide seed money, technical assistance and supervision. They can work with schools to develop leisure counseling centers and can develop volunteer opportunities that strengthen intergenerational connections among adolescents and adults from different social and economic backgrounds. They also could establish funded positions for adolescents to serve as apprentice-level adolescent workers.

Recent Federal Initiative: National and Community Service Act of 1990

In 1990, Congress passed a law designed to enhance opportunities for national and community service for all U.S. citizens, particularly the disadvantaged. This law, the National and Community Service Act of 1990 (Public Law 101-610), authorizes Federal financial assistance for a number of voluntary service programs, including programs for in-school and out-of-school adolescents. In presenting the rationale for the legislation, the senatorial authors of the legislation argued in part that (S.1430, 101st Congress, 2d session):

> (1) service to the community and the Nation is a responsibility of all citizens of the United States, regardless of the economic level or age of such citizens;
>
> (2) citizens of the United States who become engaged in service at a young age will better understand the responsibilities of citizenship and continue to serve the community into adulthood;
>
> (3) serving others builds self-esteem and teaches teamwork, decisionmaking, and problem-solving;
>
> (4) the 70,000,000 youth of the United States who are between the ages of 5 and 25 offer a powerful and largely untapped resource for community service;
>
> (5) conservation corps and human service corps provide important benefits to participants and to the community;
>
> (6) the Volunteers in Service to America Program is one of the most cost effective means of fighting poverty in the United States. . .

Many of the activities and program requirements authorized by the National and Community Service Act of 1990 (Public Law 101-610) are particularly relevant to adolescents.

Title I of the National and Community Service Act of 1990 establishes a National and Community Service State Grant Program. Several subtitles of Title I are relevant to adolescents:

—*Subtitle B. School-Aged Service* (Serve America; The Community Service, Schools and Service Learning Act of 1990).[34] This subtitle provides Serve America grants to States or local applicants for service-learning programs for students,[35] community service programs, and adult volunteer programs. For the latter two programs, dropouts and other out-of-school youth (individuals under age 27 who have not completed college or the equivalent and who are not in school) are target participants and recipients. Serve America grants will be administered by the Commission on National and Community Service established under Subtitle G (202b).

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[34] "To be eligible to receive a grant [under Title I, Subtitle B], a State. . .shall prepare and submit, to the Commission [on National and Community Service, established under section 190 of the act], an application. . .including a description of the manner in which. . .economically and educationally disadvantaged youths, including individuals with disabilities, youth with limited basic skills or learning disabilities, and youth who are in foster care, are assured of service opportunities" (S.1430, Title I, Subtitle B, Sec. 113).

—*Subtitle C. American Conservation and Youth Corps* (American Conservation and Youth Service Corps Act of 1990)—This authorizes grants to States, Indian tribes, local agencies, to the Secretary of Agriculture, to the Secretary of the Interior, or to the Director of ACTION for the creation or expansion of full-time or summer youth service programs focusing on conservation and human services. Full-time youth service programs are intended for 16- to 25-year-olds, and the summer youth service programs are intended for 15- to 21-year-olds. The law requires that participants' educational levels be assessed and that participants be provided with appropriate education and training. Priority for services must be given to participants without high school diplomas, and the program must enable such participants to earn a diploma or its equivalent. Arrangements may be made with schools to upgrade literacy skills, obtain high school diplomas or the equivalent, obtain college degrees, or improve work skills. Youth corps grants will be administered by the Commission on National and Community Service (202b).

—*Subtitle D. National and Community Service* (National and Community Service Act)—This authorizes grants to States and Indian tribes for the creation of full- and part-time national and community service programs to address unmet educational, human, environmental, and public safety needs, especially those needs relating to poverty. The programs will include full- and part-time volunteers age 17 and older. National and Community Service grants will be administered by the Commission on National and Community Service (202b).

—*Subtitle E. Innovative and Demonstration Programs and Projects*—One part of this provides for grants to States and Indian tribes for the creation of innovative volunteer service programs. Section 165 authorizes a rural youth service demonstration project. Projects may include volunteer service involving the elderly and assisted-living services performed by students, school dropouts, and out-of-school youth.

—*Subtitle G. National Commission on National and Community Service*—This establishes the National Commission on National and Community Service to administer Title I programs. The Commission is to be composed of 21 members to be appointed by the President. The Secretary of Education, Secretary of Health and Human Services, Secretary of Labor, Secretary of Interior, Secretary of Agriculture, and the Director of ACTION shall serve as ex-officio members of the Commission. Not later than January 1, 1993, the President shall prepare and submit to Congress a report containing recommendations for the improvement of the administration and coordination of volunteer, national, and community service programs administered by ACTION, the Commission on National Service, and other Federal entities.

Congress authorized $56 million for Title I in fiscal year 1991, $95.5 million in fiscal year 1992, and $105 million for fiscal year 1993. In each of these years, not less than 30 percent is to be allocated for subtitle B, not less than 30 percent for subtitle C, and not less than 30 percent for subtitle D. In each year, Congress authorized $2 million for the National Commission on National and Community Service.

Title II of the National and Community Service Act of 1990 modifies a number of existing programs. The following subtitles are relevant to adolescents:

—*Subtitle B. Youthbuild Projects* (amends the Domestic Volunteer Service Act of 1973 (42 USC 4951 *et seq*)—This provides for the Director of ACTION, in consultation with the Secretary of Labor, to provide Federal grants for Youthbuild projects. Such projects, which involve constructing and rehabilitating housing and community facilities (e.g., youth recreation centers, senior citizen centers, community health centers) for low-income people, are intended to provide economically disadvantaged young people with opportunities for service to their communities and opportunities to obtain education and employment skills. At least 75 percent of the participants must be individuals who are ages 16 to 24, economically disadvantaged, and high school dropouts whose reading and math skills are at or below the eighth grade level. Projects must provide basic skills instruction and remedial education, bilingual education for participants with limited English proficiency, and secondary education leading to a high school diploma or its equivalent.

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[35] The law defines service learning as a method under which students learn and develop through active participation in organized service experiences that meet actual community needs and that are coordinated in collaboration with the school and community; that is integrated into the students' academic curriculum; that provides students with opportunities to use newly acquired skills and knowledge in real life situations in their own communities; and that enhances what is taught in school by extending student learning beyond the classroom into the community and helps to foster the development of a sense of caring for others (Title I, Subtitle A, Sec. 101. Definitions).

—*Subtitle C. Amendments to Student Literacy Corps* (amends the Higher Education Act of 1965 (20 USC 1018))—This amends the act to give priority in providing tutoring services to educationally disadvantaged students receiving services under Chapter 1 of Title I of the Elementary and Secondary Education Act of 1965 and to illiterate parents of educationally or economically disadvantaged elementary school students, with special emphasis on single-parent households.

For Title II, Congress authorized $5 million for fiscal year 1991, $7.5 for fiscal year 1992, and $10 million for fiscal year 1993.

While the total amounts authorized for programs with a considerable emphasis on adolescents are not very large, the National and Community Service Act of 1990 does begin to address many of the concerns about adolescent rolelessness and preparation for the future expressed by numerous observers (160,330). It is too early to judge the effectiveness of the legislation in improving the lives of adolescents, but Congress could encourage the newly established Commission on National and Community Service (also established by Public Law 101-610), to evaluate systematically the impact on adolescents in the Commission's report to Congress.

Conclusions and Policy Implications

Time spent in school and time spent in discretionary (nonschool, nonmaintenance) activities constitute large segments of an adolescent's life. Outside the family and home,[36] important and influential environments for adolescents include school buildings and personnel, and peers and adults in community settings (including the media). This chapter has reviewed several shortcomings in many school and other environments and suggested ways in which these environments can be improved.

Although little systematic empirical research has been supported, the studies that have been conducted suggest that academic and health outcomes of adolescent students are influenced by school environments. Overall, school environments that facilitate adolescent well-being take the shape of small (fewer than 1,000 students in the school, and 15 to 20 per class), comfortable, safe, intellectually engaging, and emotionally intimate communities. Transitions are minimized, and when they must occur, they are managed with a view toward meeting the developmentally appropriate needs of adolescents. Teachers are encouraged to initiate and develop new programs that are sensitive to the diversity of their students. The curriculum responds to individuality as well as to differences, while developing a common knowledge base among students in a particular school. Teacher, parent, and student participation in decisionmaking is encouraged. Unfortunately, this combination of features characterizes few schools, particularly those public schools serving socioeconomically and educationally disadvantaged students, many of whom are racial and ethnic minorities. Instead, the larger, often impersonal, schools that these students attend have been found to be associated with higher rates of retention in grade, suspensions from school, discipline and crime problems, lowered social cohesion, more negative student attitudes, and greater student passivity (including lower participation in school activities, and less interaction with faculty).

Specific practices such as tracking and "teaching to the test" for minimum competency testing have been associated with lowered levels of academic achievement, retention in grade, and school dropout, especially for low income racial and ethnic minority students. Although school practices and policies are rarely investigated for their direct links to adolescent health and well-being, studies have shown that lower grades are associated with violence toward school property, other delinquency, and pregnancy. Students who are retained in grade school are more likely to drop out of school before graduation. In turn, school dropout is associated with high rates of subsequent poverty and unemployment, underemployment, diminished earnings, and adolescent pregnancy and parenting.

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[36] Parents and families' influences on adolescent health are reviewed in ch. 3, "Parents and Families' Influence on Adolescent Health," and elsewhere in this volume.

Adolescents, particularly females, can be particularly harmed by the transition from elementary to middle or junior high school grades, if such transitions are not handled well in the middle school setting. The environment of the typical junior or middle school adolescent has been found to clash with early adolescents' needs for autonomy, their budding cognitive abilities to think at an abstract level, their heightened needs for intimacy, and their heightened self-consciousness.

Teachers' attitudes and parental involvement are critical links in the relationships between school policies and environments and health outcomes for adolescents. Teachers' attitudes toward students tend to be more positive in schools that are smaller, use decentralized governance and participatory decisionmaking, and rely less on standardized testing. Parental involvement in schools has been shown to be related to increasing the responsivity and efficiency of schools and to fair treatment of students, but the evidence on academic achievement is mixed.

Some interventions have yielded increased tolerance across racial groups and improvements in the self-esteem or academic achievement of racial and ethnic minorities; these interventions include exposure to persons of differing cultural backgrounds, learning in mixed-ability groupings, a multicultural curriculum, bilingual education, and school-based collaborations with minority communities.

Much of adolescents' time is spent away from school. The scarce data that are available suggest that sufficient opportunities do not exist for adolescents to spend their discretionary time in ways that are attractive and satisfying, conducive to healthy development, and acceptable to the adult community. The problem has been found to be worse in poor than in middle-class communities.

The Federal share in funding for schools (6.3 percent of public school revenues in 1988) rose until 1980, when it began to fall again. Financial and programmatic support for recreation and youth service activities from Federal, State, and local governments, and the private for-profit sector, has been meager and fragmented. Federal support for 4-H clubs and, more recently, the National and Community Service Act of 1990 (Public Law 101-610) is an exception.

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Part II:

PREVENTION AND SERVICES RELATED TO SELECTED ADOLESCENT HEALTH CONCERNS

PREVENTION AND SERVICES RELATED TO PHYSICAL HEALTH PROBLEMS

Chapter 5

ACCIDENTAL INJURIES: PREVENTION AND SERVICES

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Chapter 5

ACCIDENTAL INJURIES: PREVENTION AND SERVICES[1]

Introduction

Broadly speaking, injuries to adolescents are of two general types, accidental (or unintentional) injuries[2] and nonaccidental injuries such as those inflicted in suicide attempts or assaults.[3] Accidental injuries are responsible for more deaths to American adolescents than any other problem, causing more than half of all deaths to persons ages 10 to 19[4] (see figure 5-1). In 1987, 55 percent of all deaths to persons ages 10 to 19 were due to accidental injuries (93). That year, 10,658 U.S. adolescents ages 10 to 19 died from accidental injuries (93). Many more adolescents experienced accidental injuries that caused visits to physicians' offices or hospital emergency rooms, temporary or permanent disability, restricted-activity and school-loss days, and other problems. This chapter reviews information on the problem of accidental injuries for U.S. adolescents, the factors associated with accidental injuries among adolescents, consequences of accidental injuries, and the effectiveness of different strategies to prevent accidental injury. The chapter also describes major Federal Government policies and programs pertaining to accidental injuries.

Background on Accidental Injuries Among Adolescents

Sources of Data on Accidental Injuries

No single source of information provides comprehensive data on the cause, nature, and severity of injuries among the U.S. population (58). Particularly lacking are detailed data on injuries that do not result in death.[5] [6]

National data on injuries currently have to be gathered from the National Center for Health Statistics in the U.S. Department of Health and Human Services (DHHS), the National Highway Traffic Safety Administration (NHTSA) in the U.S. Department of Transportation, and other sources. These sources offer data that include:

- mortality data based on death certificates,
- national, population based, health survey data,

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[1] This chapter is based, in part, on a background paper on unintentional injuries prepared for OTA (66). OTA, however, takes full responsibility for the use of information in this chapter, and for the use of the phrase "accidental injuries" rather than "unintentional injuries."

[2] To make this Report more accessible to the lay reader and for other reasons, OTA has chosen to use the term accidental injury in this Report. The term preferred by those in the injury prevention community, however, is unintentional injury (e.g., 66). Those who prefer the term unintentional injury believe that the term accidental injury implies that injuries cannot be prevented, whereas the term unintentional injury implies that while an individual may not have consciously intended to hurt him or herself, some action taken or not taken may have prevented the injury. Perhaps to overstate this perspective somewhat, all injuries are avoidable. The position that true "accidents" do not occur (i.e., by chance, entirely without cause) correctly brings attention to injuries as a public health problem to which additional preventive interventions can and should be applied, but it seems to be unprovable. Use of the term unintentional also may have the unfortunate effect of placing the onus of causation (and responsibility for precautions) exclusively on the person who is injured, although in fact unintentional injuries may be caused unintentionally, by persons, organizations, or systems other than the victim.

[3] Information on adolescent suicide is presented in ch. 11, "Mental Health Problems: Prevention and Services," in this volume. Information in homicide among U.S. adolescents is presented in ch. 13, "Delinquency: Prevention and Services," in this volume, and in ch. 18, "Issues in the Delivery of Services to Selected Groups of Adolescents," in Vol. III.

[4] The focus of this OTA Report is on adolescents ages 10 through 18. There is no single agreed-upon definition of adolescents, however, and much of the data reported in this chapter is for individuals ages 10 through 19, because data obtained from the National Center for Health Statistics on causes of death for adolescents are reported using age breaks of 10 to 14 and 15 to 19. Differences in Federal agencies' definitions of adolescence are discussed in ch. 19, "The Role of Federal Agencies in Adolescent Health," in Vol. III.

[5] There are relatively more data available on injuries related to motor vehicle crashes because of the efforts of the National Highway Traffic Safety Administration (NHTSA) and the Insurance Institute for Highway Safety, both of which have a mandate to study automobile injuries (47).

[6] The National Center for Health Statistics is currently working on merging and expanding its health care surveys (87a). Designed to include a patient followup component and linkage with the household interview survey, the new National Health Care Survey will generate data that will permit analysis of patient outcomes, the relationship between uses of health services and health characteristics, and the use of health care at the local level (87b). As discussed further in app. C, "Issues Related to the Lack of Information About Adolescent Health and Health and Related Services," in Vol. I of this Report (76a), oversampling of adolescents and their use of health services is also required to improve the Nation's knowledge base about adolescent health.

- health care services utilization data (e.g., hospital discharge abstracts, hospital emergency room reports, and surveys of office-based physicians), and
- traffic accident data (78).[7]

In addition to national sources of data on injuries, there are a number of smaller, local or regional studies that provide data on injuries. The generalizability of data from these smaller studies is limited. In the aggregate, however, these studies do provide some useful information about accidental injuries among adolescents.

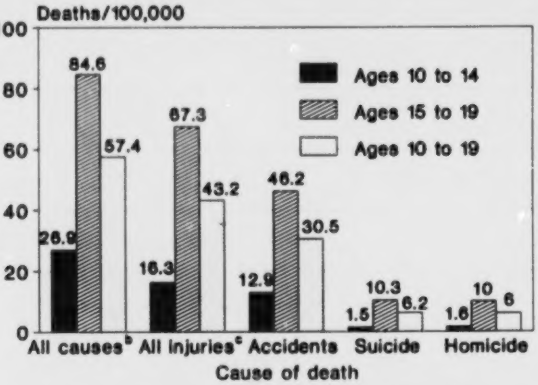
Trends in the Incidence and Prevalence of Accidental Injuries Among Adolescents

Injury Deaths and Death Rates

Over time, the prominence of accidental and other injuries as a cause of death for young people has increased, in part because of the significant decrease in the numbers of deaths associated with infectious disease (78,88). *Injury death rates* for adolescents ages 10 to 14 decreased from 23.6 deaths per 100,000 in 1950 to 16.3 per 100,000 in 1987, but the rates for adolescents ages 15 to 19 actually increased over the same period, from 55.6 deaths per 100,000 to 67.3 per 100,000 (65,93). *Accidental injury death rates* for adolescents declined between 1970 and the mid-1980s. But between 1986 and 1987, they leveled off for 10- to 14-year-olds and increased for 15- to 19-year-olds (see figure 5-2).

In 1987, approximately half of *all* deaths—and more than two-thirds (70 percent) of *injury* deaths—among U.S. adolescents ages 10 to 19 were due to accidental injuries (see figure 5-1 and table 5-1). The percentage of injury deaths that are accidental changes during adolescence. In 1987, for example, 79 percent of *injury* deaths among adolescents ages 10 to 14 were accidental, but 69 percent of the injury deaths for adolescents ages 15 to 19 were accidental.

Figure 5-1—Death Rates Among U.S. Adolescents Ages 10 to 14 and Ages 15 to 19, by All Causes and External Causes of Death, 1987



[a]Although this OTA Report focuses on adolescents ages 10 to 18, the data here are for 5-year age groups and therefore include 19-year-olds.
[b]"All causes" includes injuries and diseases. The rates at which causes of death other than injuries occurs in the adolescent population are relatively small—e.g., malignant neoplasms, the next highest cause of death after injuries, occurs in 10- to 19-year-olds at a rate of 3.7 per 100,000 adolescents ages 10 to 19.
[c]"All injuries" includes accidents, suicide, homicide, and other injuries.

SOURCE: Office of Technology Assessment, 1991, based on U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Center for Health Statistics, unpublished 1987 mortality rates, Hyattsville, MD, 1990.

Health Survey Data on Injuries

Data on injuries available from the National Health Interview Survey[8] (NHIS) conducted by the National Center for Health Statistics in DHHS indicate that each year about 30 percent of U.S. children and adolescents ages 5 to 17 experience an injury (92). NHIS does not provide separate breakdowns for accidental and intentional injuries.

Data from the 1988 NHIS indicate that injuries accounted for 18 percent of restricted-activity days[9] reported for adolescents ages 10 to 18 in 1988 (93). Adolescent males had more injury-related restricted-activity per 100 adolescents than adolescent females.[10]

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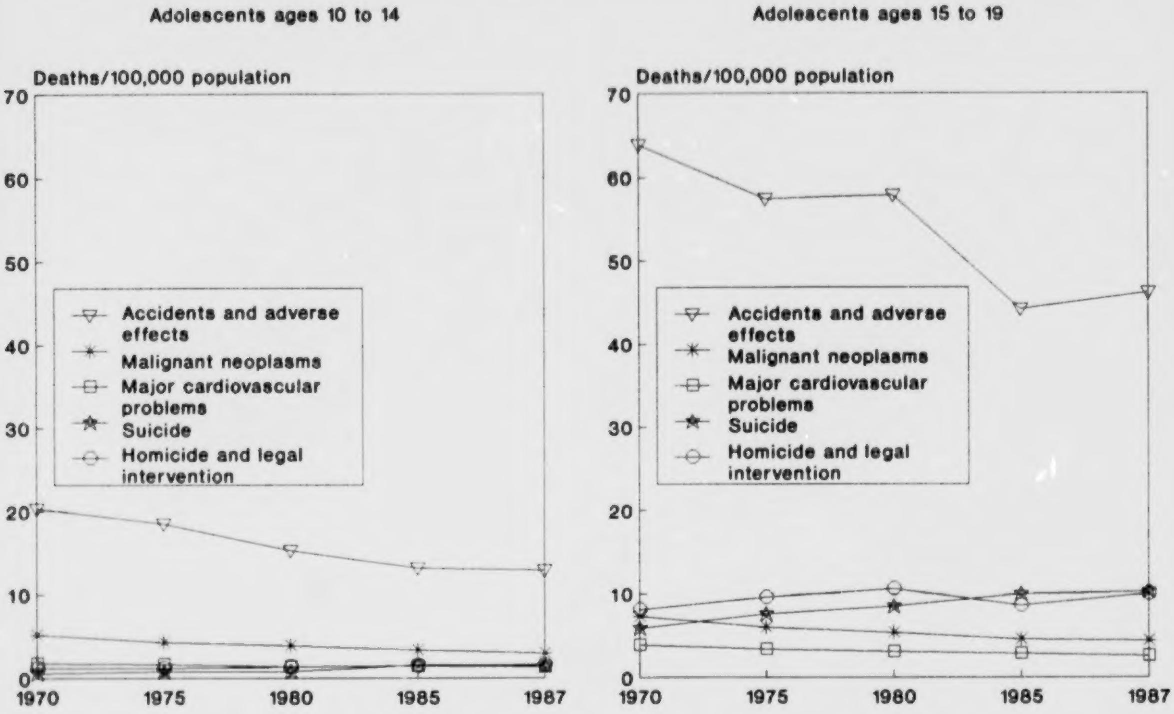
[7] Several Federal sources of data on physical health of U.S. adolescents are described in box 6-B in ch. 6, "Chronic Physical Illnesses: Prevention and Services," in this volume.

[8] The National Health Interview Survey collects data on children and adolescents up to age 17 from their parents, usually their mothers.

[9] As defined by the National Health Interview Survey conducted by DHHS, a *restricted-activity day* is any day on which a person cuts down his or her usual activities for more than one-half day because of an illness or an injury. Restricted-activity days are unduplicated counts of bed-disability days, work-loss days, and school-loss days, and other days on which a person cuts down on his or her usual activity (92).

[10] See table 6-5 in ch. 6, "Chronic Physical Illnesses: Prevention and Services," in this volume for data on restricted-activity days associated with injuries.

Figure 5-2—Death Rates for the Five Leading Causes of Death Among U.S. Adolescents Ages 10 to 14 and Ages 15 to 19, 1970-87



SOURCE: Office of Technology Assessment, 1991, based on U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Center for Health Statistics, *Vital Statistics of the United States 1970, Vol. II—Mortality* (Washington, DC: U.S. Government Printing Office, 1974); U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Center for Health Statistics, *Vital Statistics of the United States 1975, Vol. II—Mortality* (Washington, DC: U.S. Government Printing Office, 1979); U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Center for Health Statistics, *Vital Statistics of the United States 1980, Vol. II—Mortality*, Pub. No. (PHS) 85-1101 (Washington, DC: U.S. Government Printing Office, 1985); U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Center for Health Statistics, *Vital Statistics of the United States 1985, Vol. II—Mortality*, Pub. No. (PHS) 88-1102 (Washington, DC: U.S. Government Printing Office, 1987); and U.S Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Center for Health Statistics, unpublished 1987 mortality data, Hyattsville, MD, 1990.

School-loss days are a subset of restricted-activity days (92).[11] NHIS data indicate that injuries were responsible for 8.5 percent of school-loss days associated with acute conditions among adolescents ages 10 to 17 in 1988 (93).[12] Again, adolescent males had higher rates of school-loss days associated with injuries than adolescent females.

Injury-Related Health Services Utilization

According to data from the 1985 National Ambulatory Medical Care Survey conducted by the National Center for Health Statistics in DHHS, some 8,177,000 visits to private office-based physicians' offices by adolescents ages 10 to 18 in 1985 were for a diagnosis of injury or poisoning, accounting for

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[11] As defined by the National Health Interview Survey conducted by DHHS, a *school-loss day* is any day on which a child did not attend school for at least half of his or her normal school day because of a specific illness or injury (92). School-loss days are determined only for children 5 to 17 years of age, beginning in 1982.

[12] See table 6-6 in ch. 6, "Chronic Physical Illness: Prevention and Services," in this volume for data on school-loss days associated with injuries.

Table 5-1—Average Annual Accidental Injury Deaths and Death Rates Among U.S. Adolescents Ages 10 to 14 and Ages 15 to 19, 1984-86

	Ages 10 to 14		Ages 15 to 19	
	Deaths	Rate (per 100,000)	Deaths	Rate (per 100,000)
Vehicle-related:				
Motor vehicle occupant	458	2.69	3,770	20.18
Drivers	56	0.33	2,094	11.21
Passengers	402	2.36	1,676	8.97
Motorcycles	87	0.51	639	3.42
Pedestrians	294	1.72	515	2.76
Bicycles	219	1.28	142	0.76
Other & vehicle unspecified	203	1.19	1,526	8.17
Other:				
Drowning	280	1.64	566	3.03
Firearms	169	0.99	248	1.33
Fires/burns	174	1.02	238	1.27
Falls	39	0.23	143	0.77
Other accidental	324	1.90	752	4.02
Total accidental	2,248	13.18	8,537	45.69

SOURCES: U.S. Department of Commerce, Bureau of the Census, *Current Population Reports, Series P-25, No. 1000, Estimates of the Population of the United States by Age, Sex, and Race: 1980 to 1986* (Washington, DC: U.S. Government Printing Office, 1987); U.S. Department of Health and Human Services, Public Health Service, National Center for Health Statistics, *Vital Statistics of the United States, Volume II, 1984-1986 Mortality, Part A* (Washington, DC: U.S. Government Printing Office).

16.3 percent of adolescents' visits to physicians' offices (89).[13] Presumably, many adolescents with injuries are treated at home, in clinics, by athletic trainers, or in emergency rooms. Data from hospital emergency rooms on visits associated with a range of consumer products are discussed below (79,80, 81).[14]

The National Hospital Discharge Survey, also conducted by the National Center for Health Statistics within DHHS, reports that in 1987 injuries and poisonings together were the most frequent reasons for adolescents' hospitalizations (91).[15] In 1988, injuries and poisonings accounted for approximately 31 percent of hospitalizations of adolescent males ages 10 to 14 and 42 percent of hospitalizations of males ages 15 to 18 (91). The percentage of hospitalizations due to injuries for adolescent females that year was lower; injuries accounted for approximately 26 percent of hospitalizations of 10- to 14-year-old females and 9 percent of hospitalizations of 15- to 18-year-old females. It is not possible to distinguish accidental from nonaccidental injuries in hospital discharge data (91).[16]

Specific Types of Injuries Among Adolescents

Information on the causes of *fatal* injuries to adolescents is available from the Vital Statistics System of the National Center for Health Statistics in DHHS. As shown in figure 5-3, about three-fourths of accidental injury deaths among U.S. adolescents ages 10 to 19 in 1984 to 1986 resulted from vehicle-related accidents (99,100,101). Deaths from vehicle-related accidents include deaths among drivers and passengers in cars, all-terrain vehicles (ATVs), and bicycles. Drowning is also a significant cause of accidental death among adolescents, ac-

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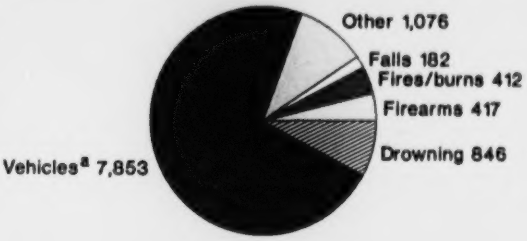
[13] See table 6-3 in ch. 6, "Chronic Physical Illnesses: Prevention and Services," in this volume for data on office visits to physicians associated with injury and poisoning. The National Ambulatory Medical Care Survey does not provide a breakdown of visits by type of injury (i.e., accidental or intentional). Furthermore, the number of visits for injury is undoubtedly higher than the number of individual patients, making a count of individual adolescents difficult.

[14] See section below entitled "Specific Causes of Injury Among Adolescents."

[15] See table 6-2 in ch. 6, "Chronic Physical Illnesses: Prevention and Services," for data on hospital discharges associated with injuries among adolescents.

[16] More complete information on the diagnoses involved in adolescents' visits to physicians' offices and hospitalizations can be found in ch. 6, "Chronic Physical Illnesses: Prevention and Services," in this volume.

Figure 5-3—Accidental Injury Deaths by Cause Among U.S. Adolescents Ages 10 to 19, 1984-86



[a] This category includes deaths among drivers, passengers, and pedestrians; and includes cars, trucks, all-terrain vehicles, motorcycles, bicycles, and other and unspecified motor vehicles. Differences by type of vehicle and age are reported in table 5-1.

SOURCE: Office of Technology Assessment, 1991, based on U.S. Department of Health and Human Services, Public Health Service, National Center for Health Statistics, *Vital Statistics of the United States—Vol. II, Mortality* (Washington, DC: U.S. Government Printing Office, various years).

counting for nearly 8 percent of accidental injury deaths (see figure 5-3). Other important causes of accidental injury deaths among adolescents are firearm accidents, fires/burns, and falls.

Comprehensive national data on *nonfatal* accidental injuries are not available. Neither NHIS nor the National Hospital Discharge Survey nor the National Ambulatory Medical Care Survey obtains information on the causes of such injuries.

One source of cause-specific data on health services utilization related to injuries is the U.S. Consumer Product Safety Commission's National Electronic Injury Surveillance System, conducted in U.S. emergency rooms (80). This survey is limited, however, in that it excludes motor vehicles and firearms from its purview. Data from a review by the U.S. Consumer Product Safety Commission of the top 20 leading consumer products associated with accidental injuries resulting in emergency room treatment for adolescents ages 10 to 18 in 1988 reveals that the vast majority of such injuries are associated with recreational activities (see table 5-2) (80). Among the leading categories of products are those involved in basketball, football, baseball, skateboarding, wrestling, roller skating, or bicycling. Injuries are reported both for organized and informal activities (80).

Photo credit: Education Week

Sports, including organized sports, are a leading cause of nonfatal injuries among adolescents. According to data from the U.S. Consumer Product Safety Commission's surveillance system, football accounted for nearly 236,000 visits to hospital emergency rooms in 1988.

Local studies provide additional information about the causes of nonfatal injury to adolescents. In a statewide study in Massachusetts,[17] sports injuries accounted for the greatest number of injuries in adolescents ages 13 to 19 that resulted in medical treatment (32). This study estimated that 1 in 14 adolescents ages 13 to 19 required hospital treatment for sports injury and 20 percent of these injuries were from football (32). The authors suggest that because of the methodological limitations of their study, these figures should be considered minimal injury rates.

A more detailed discussion of motor-vehicle-related injuries, drowning, firearm-related injuries, and injuries associated with sports and recreational activities (e.g., football, bicycling) is presented below.

Motor-Vehicle-Related Injuries

National data indicate that vehicle-related injuries are the leading cause of accidental injury deaths among U.S. adolescents ages 10 to 19. Fatal motor vehicle injuries account for the largest proportion of

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[17] This study collected data on fatal and nonfatal unintentional injuries to a sample of over 5,000 children and adolescents ages 0 to 19 in Massachusetts over a 1-year period as part of the Massachusetts Statewide Childhood Injury Prevention Program Surveillance System (32). Adolescents ages 13 to 19 made up about half of the sample.

Table 5-2—Top 14 Consumer Products[a] Related to Accidents Leading to Hospital Emergency Room Visits Among U.S. Adolescents Ages 10 to 18, 1988

Consumer product	Number of emergency room visits
Basketball	244,166
Organized	81,176
Informal	26,850
Not specified	136,140
Football	235,853
Organized	110,253
Informal	28,174
Not specified	97,426
Bicycles or accessories	182,031
Baseball	109,920
Organized	47,463
Other	62,457
Stairs or steps	102,297
Knives, not elsewhere classified	57,774
Soccer	54,820
Organized	27,025
Other	27,795
Skateboards	50,095
Floors or flooring materials	46,846
Nails, screws, carpet tacks, or thumbtacks	43,600
Doors, not specified	41,738
Ceiling and walls	37,301
Roller skating (activity, apparel, or equipment)	31,729
Wrestling (activity, apparel, or equipment)	30,990

[a] The U.S. Consumer Products Safety Commission keeps track of injuries associated with activities that involve the use of consumer products, although every injury is not directly caused by the product. They do not collect data on accidents involving motor vehicles or firearms.

SOURCE: U.S. Consumer Product Safety Commission, unpublished 1988 data from the National Electronic Injury Surveillance System, 1989.

fatal vehicle-related injuries among U.S. adolescents, especially 15- to 19-year-olds (table 5-1).[18] Drivers ages 16 to 19 represent only 6 percent of licensed drivers but account for 13 percent of all fatal motor vehicle crashes (110). Adolescent drivers are at greatest risk of becoming involved in a motor vehicle crash when they drive at night. Although adolescent drivers do only 20 percent of their driving at night, they suffer more than half their crash fatalities during nighttime hours (42,123). In 1988, half of all fatal crashes involving drivers ages 15 to 17 took place between the hours of 4 p.m. and midnight (110).[19] The nighttime fatality rates for adolescent males exceed those for females by more than two to one (122,123). Most motor vehicle crashes involving adolescents take place on the weekend. In 1988, adolescent drivers ages 15 to 17 were most frequently involved in fatal crashes on Fridays or Saturdays; 40 percent of fatal crashes took place on one of these days. Another 16 percent took place on Sunday (110).

Photo credit: Bethesda Chevy Chase Rescue Squad

Drowning is the second leading cause of accidental injury deaths for adolescents; black adolescent males are particularly at risk.

Alcohol consumption is a risk factor for automobile crashes for persons of all ages, but it appears that adolescents may be at even greater risk than adults of becoming involved in a motor vehicle crash if they drive after consuming alcohol (42). The National Highway Traffic Safety Administration (NHTSA) in the U.S. Department of Transportation reports that about half of the motor vehicle crash fatalities among adolescents ages 15 to 19 are related to alcohol, and about a quarter of fatally injured drivers ages 15 to 19 are intoxicated at the time of their accident (116). Interestingly, however, drivers ages 16 to 19 are less likely than older drivers (e.g., those ages 20 to 24) to have consumed alcohol prior to involvement in a crash. Furthermore, in alcohol-related crashes, the average blood alcohol content is lower for the fatally injured adolescent driver than for the fatally injured adult driver (42,110). This suggests that it takes less alcohol for the adolescent driver to be at risk for a serious or fatal motor vehicle crash (42,104,117,118).[20]

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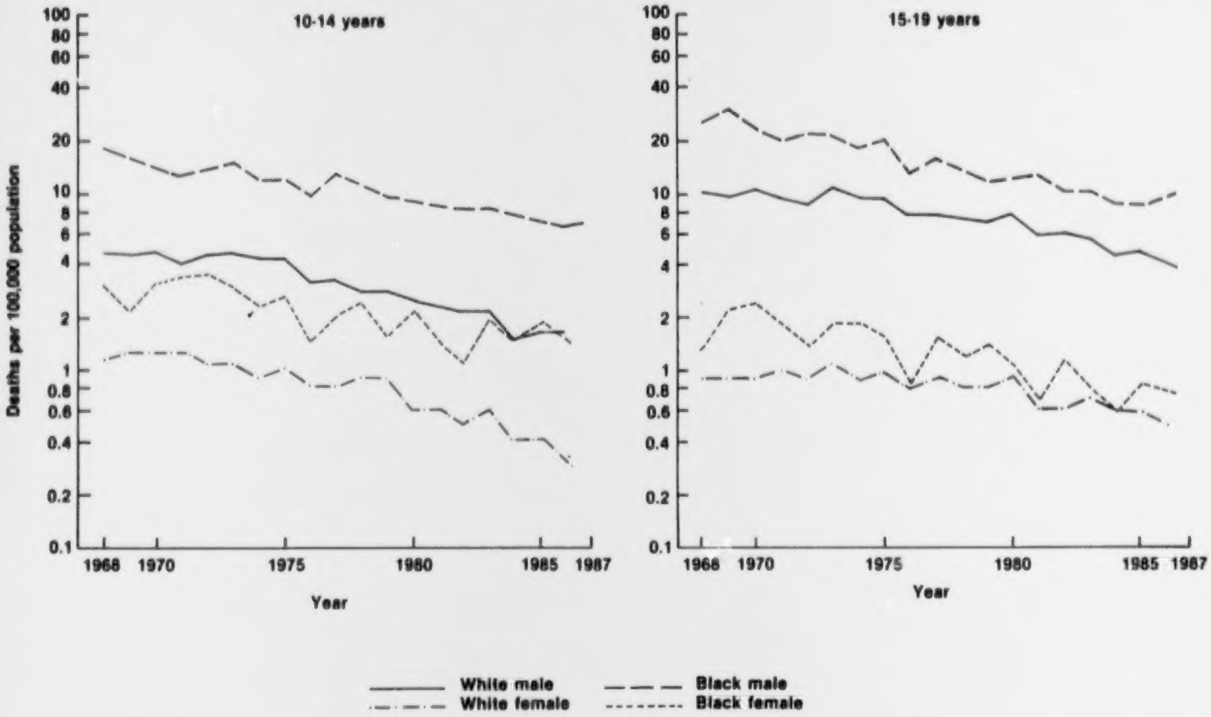
[18] Bicycle and ATV-related injuries are discussed in the section below on sports and recreational injuries.

[19] Another 18 percent of fatal crashes took place between the hours of noon and 4 p.m. (110).

[20] Risk factors, prevention, and treatment for alcohol and other drug abuse are discussed in ch. 12, "Alcohol, Tobacco, and Drug Abuse: Prevention and Services," in this volume.

Figure 5-4—Drowning Deaths Among U.S. Adolescents Ages 10 to 14 and Ages 15 to 19, by Race and Gender, 1968-87



SOURCES: 1968-85 data: U.S. Department of Health and Human Services, Public Health Service, National Center for Health Statistics, "Trends and Current Status in Childhood Mortality: United States, 1900-85," *Vital and Health Statistics*, Series 3, No. 26, DHHS Pub. No. (PHS) 89-1410 (Washington, DC: U.S. Government Printing Office, 1989). 1987 data: U.S. Department of Health and Human Services, Public Health Service, National Center for Health Statistics, unpublished mortality data, Washington, DC, 1990.

Passengers of adolescent drivers are also at increased risk of being involved in a motor vehicle crash. The majority of adolescents killed as passengers are in vehicles driven by other adolescents (124). In addition, adolescents have been found to be disproportionately involved in the vehicle-related deaths of other nonadolescent drivers, passengers, and pedestrians (122,124).

Drowning

National data indicate that drowning is the second leading cause of accidental injury death among U.S. adolescents ages 10 to 19 (88,90). A review of national drowning rates indicates that the risk of drowning increases substantially during adolescence, before peaking during the early- to mid-twenties (84). Similar patterns have been reported in local studies in North Carolina (54) and in Maryland (25).

Death rates from drowning are higher for adolescent males than for adolescent females. Furthermore, according to data from the National Center for Health Statistics in DHHS, black adolescents (particularly males) are at greater risk of drowning than their white counterparts (see figure 5-4).

The site of adolescent drowning is usually a lake, river, stream, pond, or canal rather than an ocean or swimming pool (54,126). This finding may reflect greater exposure time near these bodies of water or lower levels of supervision. Interestingly, however, the 10 to 19 age group accounted for half of all drownings in public or motel pools in a North Carolina study (54).

Alcohol is involved in close to 40 percent of adolescent drownings (39,53,54,126). Alcohol may impair judgment of the adolescent in a dangerous situation. It also may decrease the likelihood of struggling to get out of the water, thus increasing the chances of drowning (71).

Accidental Firearm Injuries

Accidental firearm injuries follow drownings as a cause of accidental injury death among adolescents ages 10 to 19 (see table 5-1 and figure 5-3). It is encouraging to note that death rates for accidental firearm-related injuries among adolescents ages 15 to 19 have recently been decreasing.[21] Accidental firearm-related death rates for adolescents ages 15 to 19 peaked in 1972 at a rate of 2.5 deaths per 100,000 population but declined to a low of 1.2 deaths per 100,000 in 1987 (29).

Accidental firearm deaths occur primarily among adolescent males. Accidental firearm-related death rates for adolescent males exceed rates for adolescent females by almost 8 to 1. Males ages 15 to 19 have the highest accidental firearm death rate (1.33 deaths per 100,000) of all other age groups. Adolescent males ages 10 to 14 have the third highest accidental firearm death rate (0.99 deaths per 100,000) (99,100,101). Racial differences among adolescent males vary somewhat by age. For males ages 10 to 14, the accidental firearm death rate is nearly twice as high for whites as for blacks (1.93 deaths per 100,000 v. 0.97 deaths per 100,000). Among 15- to 19-year-old males, rates are slightly higher among blacks than whites (2.56 deaths per 100,000 v. 2.31 deaths per 100,000) (29,99,100,101).

National data on nonfatal accidental firearm injuries among U.S. adolescents are unavailable (5).[22] A Massachusetts study found that accidental firearm injuries were a less common type of accidental injury among adolescents ages 13 to 19 presenting to hospital emergency rooms, with a rank order of 15 among all injuries (32).

Little is known about risk factors associated with accidental firearm injuries among U.S. adolescents, but adolescents' exposure to firearms appears to be quite high. Over 40 percent of the 8th and 10th graders surveyed in the National Adolescent Student Health Survey in 1987 reported that they had used a gun during the past year; of these, over 40 percent had used a gun more than 10 times (6). In general, the source of these firearms is unknown. However, the National School Safety Center reports that the overwhelming majority of weapons that have been confiscated in schools were obtained legitimately (e.g., from parents) (50a). About half the American households reported having a gun in 1989 (76).

Information on when and where accidental firearm-related deaths occur among U.S. adolescents is quite limited. In 1984, more than 30 percent of the fatalities of adolescents ages 10 to 14 that occurred in the home resulted from firearm injuries; this was a significantly higher percentage than for children in younger age groups (85). A study of a limited sample of 88 accidental firearm deaths among children through age 14 in California indicated that most of these deaths occurred while children were playing with a gun (127).

In rural areas, accidental firearm injuries may be associated with hunting. A study of accidental firearm fatalities in North Carolina indicated that 28 percent of accidental firearms deaths to adolescents ages 15 to 19 occurred while hunting (45). Another study of hunting-related accidental firearm injuries revealed that younger victims (ages 8 to 19) of hunting injuries were more likely than older hunters to engage in unsafe hunting practices, including carrying the gun incorrectly (21).

Sports and Recreational Injuries[23]

As noted above, sports and recreational activities appear to be a leading source of nonfatal adolescent injury. The U.S. Consumer Product Safety Commission has reported that, in fiscal year 1987, sports and recreational activities and equipment were responsible for nearly $2 billion in costs of hospital emergency room treatment for injuries to persons ages 5 to 24, more than any other class of consumer products[24] (79).

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[21] Unfortunately, however, adolescent death rates for homicide and suicide involving the use of firearms have continued to increase. See ch. 11, "Mental Health Problems: Prevention and Treatment" (suicides), and ch. 13, "Delinquency: Prevention and Treatment" (homicides), in this volume.

[22] Because firearms are not under the jurisdiction of the U.S. Consumer Product Safety Commission, data on firearm-related injuries are not included in the Commission's National Electronic Injury Surveillance System (78).

[23] For a general discussion of adolescent fitness, see ch. 7, "Nutrition and Fitness Problems: Prevention and Services," in this volume.

Data from limited samples suggest that injury rates vary considerably by type of sport or recreational activity. A 1-year study of 1,283 student athletes in grades 9 through 12 found that 22 percent sustained injuries during the year (43). Students playing football were most likely to experience an injury (61 percent of those participating), followed by females participating in gymnastics (46 percent), males participating in gymnastics (40 percent), wrestling (40 percent), and males' basketball (37 percent). Males, who made up 58 percent of the sample of student athletes, experienced nearly three-quarters of the injuries.

A study of sports injuries treated at the University of Rochester Section of Sports Medicine over a 7-year period found that these injuries peaked during ages 16 to 19; this age group was responsible for 45 percent of the cases seen (24). Overall, football was responsible for the greatest number of injuries. Knee injuries were most common for all sports.

Although the relationship between physical fitness and risk of injury has not been well studied, a limited study of 124 young men and 186 young women undergoing basic military training indicated that higher physical fitness may reduce the risk of certain types of less serious sports injuries. The authors conclude, however, that fitness probably has no effect on reducing severe or catastrophic injury (22).

Football-Related Injuries—Football is one of the most hazardous interscholastic athletic activities, accounting for 28 injuries per 100 participants per year in national samples (46,74).[25] In 1988, football-related injuries were responsible for nearly 236,000 visits to emergency rooms by adolescents ages 10 to 19[26] (see table 5-2) (80). About a third of high school football players experience an injury that keeps them out of practice or a game (20).

Between 1973 and 1980, 260 high school and college players died from football-related injuries. Improvements in helmet design reduced the frequency of head trauma during the late 1960s and early 1970s but resulted in greater use of the head for blocking. As a result, in the early 1970s there was an increased incidence of neck injuries, including injuries resulting in quadriplegia. In 1976, the National College Athletic Association and the National Federation of State High School Athletic Associations ruled to prohibit "spearing" (using the head to strike an opponent while tackling), which poses particular risks for cranial and spinal cord injuries. Subsequently, the incidence of permanent quadriplegia resulting from football injuries declined from an average of 35 cases per year in 1971 to fewer than 10 per year as of 1986 (46,74).

A study examining the injury experience of 5,128 males ages 8 to 15 participating in 208 youth football teams found that 5 percent of the males sustained injuries during the football season (33). Of these, 61.4 percent were classified as moderate injuries, and 38.9 percent were classified as major injuries. Males on the oldest and heaviest teams in this age group (Junior Bantam teams) had the highest rates of injury (9.6 percent of males), and males on the smallest and youngest teams (Junior Pee Wee teams) had the lowest rate of injury (1.9 percent of males). About a third of the males experienced a fracture, the most common type of injury; another quarter sustained sprains. Most injuries (88.3 percent) resulted from contact with another player; 41 percent of injuries occurred during tackling. Over two-thirds of the injuries occurred during games or scrimmages as opposed to practices, and more injuries occurred at away games than home games. A higher prevalence of injury during practice as opposed to games has been reported by other researchers. For example, a study of 1,283 high school athletes, 179 of whom played football, indicated that about two-thirds of the football-related injuries occurred during practice. However, given the much greater amount of exposure experienced in practice rather than game episodes, it was calculated that game situations were actually more likely to produce an injury per unit of exposure (43).

It has been suggested that the elimination of kickoffs and punt returns could reduce the football-related injury rate because of the high incidence of

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[24] The U.S. Consumer Product Safety Commission keeps track of injuries associated with activities that involve the use of consumer products, although the injuries may not be caused directly by the consumer product.

[25] Higher rates have been reported in studies using more limited samples. For example, 61 percent of students playing football were reported to have sustained an injury in one study (43).

[26] This figure includes organized as well as informal football; organized football accounted for 110,253 visits to emergency rooms.

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major injuries sustained during these plays (33). In addition, improvements could be made in the teaching methods for blocking and tackling to reduce the numbers of injuries caused by direct impact by helmets; this was a cause of 18 percent of football-related injuries in a study of injuries experienced by males ages 8 to 15 participating in youth football (33).

Bicycle-Related Injuries—Adolescents ages 10 to 17 accounted for 30 percent of all fatal bicycle accidents in the United States in 1988 (110). The majority of fatal bicycle accidents in 1988 (91 percent) occurred on roadways rather than at intersections or other locations (110). Among adolescents, the older the bicycle rider, the more likely it is that an injury will be the result of a collision with a motor vehicle; as many as 90 percent of all bicycling fatalities involve motor vehicles, and they are largely the result of head injuries sustained in the accident (41). For bicycle-related injuries requiring hospital admission, the injury is five times more likely to be the result of collision with a motor vehicle than the result of some other type of event (e.g., collision with another bicycle or falling off of a bike) (31).

Figures indicating alcohol involvement among adolescent bicyclists, specifically, do not exist. Alcohol testing is not done uniformly in the case of bicycle accidents, and little information exists about exposure to alcohol among noninjured bicyclists.

All-Terrain-Vehicle (ATV)-Related Injuries—ATVs have become a source of considerable controversy since their introduction in the United States in the 1980s. Originally designed as tractors for use in the flat, wet rice paddies of the Orient, these 3- or 4-wheel vehicles have been adopted for off-road recreational use in rough terrain (66). Instability of ATVs, some of which are capable of speeds as high as 70 miles per hour, is a major problem (66). In 1985, there were 238 documented deaths attributed to ATVs among persons of all ages (2,51). In 1988, ATVs were associated with 27,000 visits to emergency rooms by adolescents ages 10 to 18 (80).

Injuries from ATVs are primarily a consequence of hitting an obstacle or tipping over. Among all age groups, head injuries are responsible for 70 percent of the deaths involving ATVs and are the major cause of hospitalization (19,70). Helmets are used by less than 20 percent of the victims, despite clear evidence of their potential to reduce the incidence and severity of head injury (27,63,73,120).

Adolescents ages 12 to 15 account for 27 percent of accidents involving 3-wheel ATVs and 42 percent of those involving 4-wheel ATVs; adolescents and young adults ages 16 to 24 account for 35 percent of accidents involving 3-wheel ATVs and 19 percent of those involving 4-wheel ATVs (1,51). Males are involved in close to 80 percent of the cases, most likely a function of their greater exposure time relative to females.

As of March 1988, the U.S. Consumer Product Safety Commission had instituted a ban on the sale of 3-wheel ATVs and ruled that the sale of 4-wheel vehicles to minors be more closely controlled[27] (75). Nonetheless, because many previously purchased 3-wheel ATVs are still being used, nearly half of the emergency room visits by adolescents ages 10 to 18 in 1988 that were associated with ATVs occurred with 3-wheel ATVs (80).

Factors Associated With Accidental Injuries Among Adolescents

Factors associated with accidental injuries can be categorized as demographic factors, risk-taking behaviors, and stressful life events.

Demographic Characteristics

Demographic characteristics of adolescents that appear to be associated with differing rates of accidental injuries among adolescents include age, gender, and race/ethnicity. While these characteristics are not amenable to change and thus cannot be the targets of intervention or prevention efforts, this information is useful to identify groups at highest risk.

Age—Children at different developmental stages experience different types of injuries (59). Thus, adolescents can be expected to have different patterns of experience with injury than younger children or adults, and older adolescents experience different patterns of injury than younger adolescents. For example, adolescents experience much higher rates of motor vehicle occupant injuries, bicycle injuries, and sports injuries than younger children, but young children are more likely to experience pedestrian accidents (32,59).

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[27] *U.S.A.* v. *Polaris Industries*, LP. 87-3525 GAG (108).

In addition, dramatic increases in the rates of accidental injury deaths occur during adolescence and early adulthood. For example, although the rate of death due to accidents in a recent year was 15.7 deaths per 100,000 population for adolescents ages 12 to 14, it was 55.8 deaths per 100,000 for those ages 15 to 17, and 93.3 deaths per 100,000 for those ages 18 to 19 (40). An evaluation of Massachusetts data also revealed differences between injury patterns for younger adolescents ages 13 to 15 and older adolescents ages 16 to 19 (9).[28] The older adolescents experienced higher rates of injury and more severe injuries than the younger ones; the older adolescents' rates of admission to hospitals due to injuries were 1.26 times higher than the younger adolescents' rates, and their death rates due to injuries were 1.50 times higher. Although the younger adolescents experienced more bicycle-related injuries, older adolescents experienced more injuries of other types, including motor vehicle occupant injuries, motorcycle injuries, burns, and deaths due to overexertion. Because 19-year-olds are likely to disproportionately contribute to the totals of injuries or deaths due to some types of accidents (e.g., motor vehicle crashes or accidents involving alcohol), figures presented in this chapter that include 19-year-olds may actually be higher than if 19-year-olds were excluded.

Gender—Adolescent males are at considerably higher risk of death from injury than adolescent females. Although there is some variation by cause of injury, total rates of injury death for males ages 10 to 19 exceed those for females by as much as 9 to 1 (see table 5-3). The magnitude of this difference is greater for older adolescents ages 15 to 19 than for those ages 10 to 14 (65). For example, the male-to-female ratio of deaths due to motor vehicle occupant injury for the years 1984 to 1986 was 1.3:1 for ages 10 to 14, compared with 2.1:1 for those ages 15 to 19; similarly, the male-to-female ratio for drowning deaths increases from 4.4:1 for ages 10 to 14, to 9.9:1 for ages 15 to 19.

Table 5-3—Male-to-Female Ratios of Injury Deaths Among U.S. Adolescents Ages 10 to 14 and Ages 15 to 19, by Selected Causes, 1984-86

Cause	Age group	
	10 to 14	15 to 19
Motor vehicle occupant	1.3:1	2.1:1
Motorcycles	4.4:1	8.2:1
Pedestrians	1.7:1	2.4:1
Fires and burns	1.5:1	2.7:1
Falls	4.8:1	5.9:1
Drowning	4.4:1	9.9:1
Firearms-accidental	8.9:1	8.9:1
Suicide	3.2:1	4.4:1
Firearms	3.6:1	5.8:1
Homicide	1.5:1	3.2:1
Firearms	2.6:1	5.0:1

SOURCE: U.S. Department of Health and Human Services, Public Health Service, National Center for Health Statistics, *Vital Statistics of the United States, Volume II—Mortality, Part A* (Washington, DC: U.S. Government Printing Office, various years).

It is impossible, because appropriate data are not systematically collected, to determine the extent to which differences between adolescent males and females in accidental injury rates are a function of differing exposure to situations where injuries may occur, or to differing susceptibility based on some other factor. There is some evidence that males tend to engage more in behaviors that put them at higher risk of injury. For example, the 1987 National Adolescent Student Health Survey of 8th and 10th graders found that 71 percent of males v. 48 percent of females rode a motorcycle or minibike during the past year; 32 percent of males v. 20 percent of females swam alone; 71 percent of males v. 46 percent of females drove or rode a go-cart, snowmobile, or ATV; and 64 percent of males v. 19 percent of females used a gun during the past year (6). These data suggest that adolescent males, and the high risk activities that males engage in, should be prime targets of preventive interventions.

Race and Ethnicity—Race and ethnicity are sometimes, but not always, differentially associated with accidental injury deaths among U.S. adolescents.[29] For example, the 1986 rate of accidental injury death for black adolescents ages 10 to 14 was 14.7 deaths per 100,000, as compared with 13.0 deaths per 100,000 for white adolescents ages 10 to 14 (40). The 1986 rate of accidental injury death for black adolescents ages 15 to 19 was 27.9 deaths per 100,000, as compared with 52.6 deaths per 100,000 for whites (40). These overall rates consist largely of

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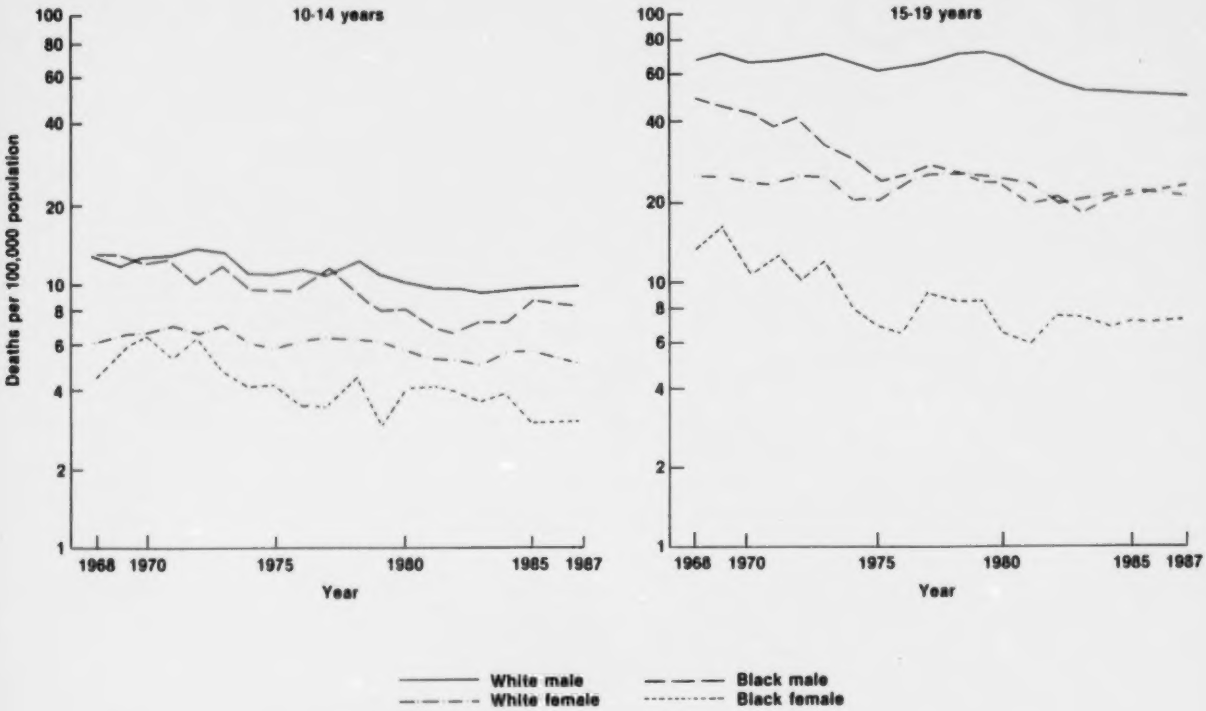
[28] Data reported by Bass and colleagues (9) were collected from Sept. 1, 1979 through Aug. 31, 1982.

[29] The extent to which racial and ethnic differences reflect factors associated with socioeconomic status is not known. See ch. 18, "Issues in the Delivery of Services to Selected Groups of Adolescents," in Vol. III for discussion.

Figure 5-5—Motor Vehicle Accident Deaths Among U.S. Adolescents Ages 10 to 14 and Ages 15 to 19, by Race and Gender, 1968-87



SOURCES: 1968-85 data: U.S. Department of Health and Human Services, Public Health Service, National Center for Health Statistics, "Trends and Current Status in Childhood Mortality: United States, 1900-85," *Vital and Health Statistics*, Series 3, No. 26, DHHS Pub. No. (PHS) 89-1410 (Washington, DC: U.S. Government Printing Office, 1989). 1987 data: U.S. Department of Health and Human Services, Public Health Service, National Center for Health Statistics, unpublished mortality data, Washington, DC, 1990.

motor vehicle accident-related deaths. As noted above, black adolescents are somewhat more likely than white adolescents to die as a result of drowning. As shown in figure 5-5, motor vehicle accident deaths declined somewhat for black male and female adolescents between 1968 and 1987, although recently, death rates have leveled off.

Native American adolescents ages 10 to 19 are at particularly high risk for injury, experiencing death from accidental injury at over twice the rate of blacks or whites. In 1986, Native American adolescents ages 10 to 14 experienced injury deaths at a rate of 33.2 per 100,000; Native Americans ages 15 to 19 experienced injury deaths at a rate of 108.4 per 100,000 (12). There are several explanations for the higher rates of injury among Native Americans (77). Because a high proportion of Native Americans live in rural areas, they are less likely to be discovered quickly if they crash, and, once injured, they may not have speedy access to trauma centers for treating emergencies. Also, because alcohol cannot be legally purchased on reservations, many Native Americans travel some distance in order to drink, thus increasing the number of miles that they drive under the influence of alcohol if they drive home after consuming alcohol.

There are few data on injuries among other racial and ethnic groups of adolescents. According to *The Injury Fact Book*, when all ages are considered together, Asians have the lowest rates of injury (8a). A recent analysis of childhood injury deaths found that Asians ages 0 to 14 had an overall injury death rate equivalent to that of white children ages 0 to 14[30] (117a). However, Asian children ages 0 to 14 were found to have higher death rates than average for pedestrian traffic deaths, drownings, and deaths resulting from falls (117a).

Other Demographic Factors—In the aggregate, both social class and rural v. urban locale have been shown to be associated with many types of injuries, but many of the specific relationships between these factors and injury among adolescents have not been well-investigated. Adolescents in rural areas have been found to be at higher risk of accidental injuries, in part because of work with farm equipment (43a). People who live in poverty, whether in rural or urban environments, are at greater risk for drowning, residential fires, and motor-vehicle-related deaths (8a). As noted elsewhere in this Report, existing data on the health status of poor adolescents and research on the health effects of poverty have severe limitations.[31]

Risk-Taking Behavior

Some adolescents engage in behaviors that potentially increase their risk of accidental injury. These include unsafe driving or bicycling practices (e.g., driving after consuming alcohol, not wearing safety belts, not wearing a helmet), participating in football or other contact sports, and not following water safety rules (e.g., swimming alone).[32]

Three types of risk-taking behaviors known to increase the risk of accidental death or injury are discussed below: alcohol or drug use, failure to use safety belts, and failure to use bicycle or motorcycle helmets.

Alcohol or Drug Abuse—Alcohol use is a major risk factor for all types of injury.[33] Alcohol affects the injury process in at least three ways. First, it impairs judgment, increasing the chances that the user will become involved in a potentially injury-producing situation (e.g., driving too fast, diving into shallow water); second, alcohol impairs the ability of the user to perform tasks necessary to avoid injury (e.g., negotiating a slippery curve while driving, swimming to shore); and third, alcohol exacerbates the severity of injuries by inhibiting the ability of the body to withstand trauma (119).

In 1988, 3,158 adolescents ages 15 to 19 died in alcohol-related motor vehicle crashes (113). Data from the U.S. Department of Transportation's Fatal Accident Reporting System indicate that there have been significant decreases in driver alcohol involvement[34] in fatal motor vehicle crashes since the early 1980s (116). In 1988, 12.1 percent of drivers under age 18 involved in fatal motor vehicle crashes had a blood alcohol content of 0.10 percent or greater, compared with 18.6 percent of drivers of that age in 1982 (110). Another 9.5 percent of the fatally injured drivers under age 18 in 1988 (and 11.4 percent in 1982) had a blood alcohol content between 0.01 and 0.09, suggesting that alcohol use below the usual legal limit is also associated with fatal accidents.

Alcohol is also frequently involved in fatal pedestrian and bicycle accidents; in 1988, 23.6 percent of victims of fatal pedestrian or bicycle accidents had a blood alcohol content of 0.10 percent or greater (110).

A review of blood alcohol levels measured in 41 adolescents ages 16 to 18 admitted to a trauma center following motor vehicle, bicycle, or pedestrian accidents in North Carolina revealed that 29 percent had measurable (although not legally prohibited) levels of blood alcohol (55).[35] Males were much more likely to test positive for alcohol than females; 32 percent of males had measurable levels of blood alcohol, compared with only 18 percent of females.

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[30] No further age breakdowns were provided.

[31] See ch. 18, "Issues in the Delivery of Health and Related Services to Selected Groups of Adolescents," in Vol. III.

[32] In 1987, for example, over a third of 8th and 10th graders participating in the National Student Health Survey reported that they swam alone during the previous year, 26.4 percent that they swam in a restricted or unsupervised area, and 28.4 percent that they dove into water of unknown depth (6).

[33] For a general discussion of the use of alcohol and other drugs by adolescents, see ch. 12, "Alcohol, Tobacco, and Drug Abuse: Prevention and Services," in this volume.

[34] NHTSA within the U.S. Department of Transportation defines a motor vehicle crash as being related to alcohol if the driver or nonoccupant (e.g. pedestrian) has a blood alcohol concentration of 0.10 percent or greater. Persons with a blood alcohol content of 0.10 percent or greater are considered to be intoxicated (116).

[35] The study also included 34 individuals ages 19 and 20. Blood alcohol content (BAC) determinations were made for only 50 of the total 86 patients admitted to the hospital during the survey period. Unfortunately, the authors do not indicate the ages of the patients for whom BAC readings were not obtained; rather they report the numbers of patients of each age with positive BAC relative to the total number of patients of each age who were admitted to the hospital.

Less information is available on the possible link between alcohol consumption and other types of accidental injuries (47). Also, other drugs, such as marijuana or cocaine, may elevate risk of injury, though no systematic epidemiologic studies have been conducted to identify the role these other drugs may play in accidental injuries.

Failure To Use Safety Belts—There is substantial evidence that the use of safety belts in cars reduces the chances of experiencing serious injury in the event of a crash. For example, although about the same proportion of restrained and unrestrained passenger car occupants involved in fatal crashes in 1988 sustained nonfatal injuries (42 percent of restrained occupants v. 40 percent of unrestrained occupants), nearly twice as many unrestrained occupants as restrained occupants were killed as a result of injuries (49 v. 26 percent) (112).[36]

Surveys of U.S. adolescents indicate that most adolescents do not wear safety belts (35). In the 1987 National Adolescent Student Health Survey of 8th and 10th graders, only 41.2 percent reported that they had worn a safety belt the last time they were in a car (6).

U.S. adolescents do report, however, that protection in a crash is one of the most important factors in their deciding to wear a safety belt; 81.2 percent of adolescents surveyed in the National Adolescent Student Health Survey reported that this was a very important factor; in comparison, only 12.1 percent said that friends' use was a very important factor, and over half reported that friends' use was not important at all (6). Riccio-Howe found that safety belt use by family and friends was an important factor in adolescents' safety belt use (57a). Laws were also found to be an important factor. Riccio-Howe found that adolescents reported higher safety belt use when a law mandating such use was in effect than when it was repealed, and that adolescents who had learned to drive during the period the law was in effect continued to report higher safety belt use (57a). The law was more predictive of adolescents' safety belt use than were the adolescents' health beliefs and perceived locus of control[37] (57a).

Failure To Use Bicycle or Motorcycle Helmets—Evidence suggests that very few adolescents wear bicycle helmets and that adolescents are less likely than bicycle riders in older age groups to wear helmets (120). Only 3.7 percent of over 200 bicyclists ages 11 to 19 interviewed in one study were found to be wearing helmets; this compared with 16.2 percent of those age 30 or older (120). In the 1987 National Adolescent Student Health Survey of 8th and 10th graders, fewer than 10 percent said that they *ever* wore a bicycle helmet, and less than 1 percent reported that they always wore a helmet (6). A review of bicycle-riding-related accidents to children ages 1 to 18 (80 percent of whom were between ages 5 and 14) found that less than 1 percent (ages not specified) had been wearing protective equipment at the time of their injury (68).

Peer influence appears to play a role in whether U.S. adolescents wear bicycle helmets. Over 60 percent of the 8th and 10th graders surveyed in the National Adolescent Student Health Survey reported that they thought that their friends would think that wearing a bicycle helmet was a "silly thing to do" (6). Anecdotal evidence suggests that some young adolescents distinguish between casual neighborhood riding of bicycles and longer bicycle trips and are more likely to wear helmets during the latter activity.

Use of helmets among adolescents riding minibikes or motorcycles is also low. As of April 1990, only 23 States required use of motorcycle helmets for riders of all ages (44). Another 23 States required use under a specified age, usually 18 (although in some States the maximum age is as low as 15 years old). Data on crashes in States where only minors are required to wear motorcycle helmets indicate that fewer than 40 percent of fatally injured minors were wearing helmets, even though the law required them to do so (114). Enforcement of helmet wearing among minors is difficult, as it can be difficult to distinguish them from older riders. Nearly 60 percent of 8th and 10th graders participating in the 1987 National Adolescent Student Health Survey reported that they sometimes rode a motorcycle or minibike; however, only a third of those reported that they always wore a helmet when riding (6).[38]

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[36] These data are for all ages combined.

[37] A person's perceived locus of control is his or her general sense that he or she either controls or is controlled by events (63a). Riccio-Howe used a locus of control scale specifically related to the occurrence of accidents (57a).

[38] Students were not asked directly whether, or how frequently, they rode a motorcycle or minibike. Rather, they were asked how frequently they wore a helmet when they did ride a motorcycle or minibike. Thus, it is not possible to determine frequency of riding from the survey responses.

Stressful Life Events

In a study that compared ill and injured hospitalized adolescents on a variety of measures including demographics, impulse control, emotional tone, and alcohol and other drug use, Slap and her colleagues found that the occurrence of stressful life events was, along with gender and previous hospitalization for an injury, a reliable characteristic distinguishing the injured from the ill adolescents (68a). The stressful life events most associated with hospitalization for an injury included suspension from school, failing a grade level, difficulty getting a summer job, breaking up with a boyfriend or girlfriend, and the death of a grandparent (68a). However, Slap and her colleagues note that their study sample was small and otherwise somewhat limited methodologically and that a prospective study to confirm the results is needed (68a). It is also important to note that 28 percent of the injured patients in the Slap et al. sample had been victims of assault; thus, the study's findings may be applicable to violent as well as accidental injuries. Nonetheless, Slap and her colleagues' results suggested that stresses that may be minimized by adults are important risk factors for injury during the adolescent years (68a). In an article directed at school nurses, Lee and colleagues also noted that high school is a stressful time for adolescents, and that there is a potential relationship between high levels of stress and accidental injury (41a).

Consequences of Accidental Injuries Among Adolescents

In general, the total dollar costs associated with injuries, both accidental and intentional, in the United States are enormous. An estimated $158 billion in aggregate lifetime direct and indirect costs[39] is imposed annually by injuries in this country (58).[40] About a quarter of those costs (around $39.4 billion) can be attributed to injuries incurred by persons ages 15 to 24 (58). It is important to note, however, that costs have not been estimated separately for 10- to 18-year-olds. Thus, it is difficult to infer the actual proportion of costs attributable to accidental injuries among 10- to 18-year-olds.

For the 15- to 24-year-old age group, motor-vehicle-related injuries are responsible for the greatest lifetime costs, followed by falls, firearms, burns and fires, drownings and near drownings, and poisonings (58). Overall, males, who experience greater mortality and morbidity due to accidental injuries, also account for more mortality and morbidity costs.

According to a study based on data gathered in the 1980 National Medical Care Utilization and Expenditure Survey, injuries and poisonings are responsible for the third greatest proportion of direct medical costs to persons under age 17,[41] accounting for $1.9 billion in 1980 dollars[42] (36).

Anecdotal evidence from case studies indicates that injuries have a tremendous impact on injured adolescents, their families, and society (58). Along with lost productivity, school absenteeism, and health care expenses, injuries can have long-term or permanent effects including disfigurement and loss of ability to perform social roles.[43] However, data on injury-related disabilities are surprisingly sparse. No national data are available to examine injury-related disability in a systematic manner. Little information is available on the long-term consequences of injuries, particularly those that are less severe (47). As a result, it is very difficult to document the impact of injury survival beyond the acute phases of treatment for injuries.

Data on the health consequences of accidents for adolescents in terms of restricted-activity days, as mentioned earlier, are available through NHIS (93). In 1988, injuries (accidental and intentional combined) were responsible for 18 percent of restricted-activity days and 8.5 percent of school-loss days for acute conditions (93).[44] Injuries were responsible for 133.5 restricted-activity days and 38.9 bed-disability days per 100 males, and 104.9 restricted-activity days and 26.1 bed-disability days for females (92). Injuries accounted for 32.3 school-loss days for every 100 students ages 10 to 17. For adolescents ages 15 to 17, injuries accounted for 55 school-loss days per 100 students.

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[39] *Direct costs* are "amounts paid for personal health care . . . (and) for home modification, vocational rehabilitation, and overhead and administrative costs for automobile and health insurance" for those injured (58). *Indirect costs* can be divided into morbidity and mortality costs; morbidity costs include the value of goods and services not produced because of injury-related illness and disability, while mortality costs constitute the value of lifetime earnings lost by all who die prematurely as a result of injury.

[40] Estimates are based on the lifetime costs for the 57 million persons injured in 1985 (58).

[41] Includes children under age 10.

[42] However, injuries and poisonings accounted for a lower proportion of direct medical care costs for injury for the under 17 age group than it did for 17- to 44-year-olds.

[43] See ch. 6, "Chronic Physical Illnesses: Prevention and Services," in this volume for additional discussion of disabilities among adolescents.

Prevention of Accidental Injuries Among Adolescents

Accidental injury prevention efforts can focus either on reducing or eliminating the occurrence of accidents or on minimizing the effects of accidents—i.e., reducing the severity of the injuries that might result from the accident.

Three basic approaches have been used for the prevention of accidental injuries: 1) persuasion or education, 2) legislation and regulation, and 3) automatic protection (47,58). The provision of direct incentives or other tangible support, sometimes combined with education, is another prevention strategy (18,26).

Although results of evaluation efforts are not definitive, there appears to be some consensus that, in general, automatic protection is the most effective strategy for injury protection, followed by laws and regulation, and that education and persuasion is the least effective strategy for injury prevention (9,47, 58,128). The use of direct incentives, sometimes combined with education, has not been evaluated as an overall strategy, but results of some programs suggest that it too is promising (18,26). As with other adolescent health problems, it is likely that no single approach to prevention is sufficient (see also 12a).

Rivara has estimated that 29 percent of deaths from trauma to U.S. children ages 1 to 14 could be prevented if only 12 currently available prevention strategies were implemented (60). Some of these strategies (e.g., use of infant restraint seats) are not applicable to adolescents ages 10 to 18. Nonetheless, Rivara's approach could be used to develop estimates of the numbers of preventable adolescent injury deaths.

Injury prevention approaches targeted to individuals (education and incentives), regulation and legislation, and automatic protection are discussed below, along with specific examples of injury prevention efforts.

Educational and Incentive Approaches

Educational strategies are some of the most widely used approaches to preventing injury; they tend to be relatively inexpensive and have a high level of community acceptance (78). The success of educational efforts, however, has been mixed, and there appears to be some consensus in the injury field that, as mentioned above, education and persuasion alone has been the least effective means of accident prevention (9,47,58,128). OTA agrees with this finding.

There are a number of reasons why educational efforts may be unsuccessful. First, the change in behavior advocated by the educational effort may be too complex (e.g., executing safe turns on a 3-wheel ATV may be quite difficult for a 13-year-old). Second, complete compliance may be required for the behavior to be effective (e.g., safety belts must be worn every time the adolescent rides in a car). Third, the required behavior may be unpleasant (e.g., adolescents may feel that wearing a bicycle helmet is hot and uncomfortable or socially unacceptable). And last, there may be other external barriers to compliance (e.g., bicycle helmets may be unaffordable or unavailable; there may be cultural, literacy, or language barriers to receiving or responding to the educational message). Thus, some interventions have offered positive incentives to adolescents to help increase health-enhancing behaviors such as the use of safety belts and bicycle helmets.

Some education may help adolescents avoid accidents. Educational efforts can be directed at many different audiences including adolescents, parents, teachers, manufacturers, and policymakers. For example, educational efforts can be directed toward convincing adolescents to use safety belts, parents can be taught how to discuss safety belt use with their children, manufacturers can be educated about public views regarding safety belt design, and policymakers can be educated about the effectiveness of a law requiring safety belt use.

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[44] Restricted-activity days are calculated for 10- to 18-year-olds. School-loss days are calculated for 10- to 17-year-olds (92).

Examples of education and incentive efforts targeted at changing the behavior of adolescents are discussed below.

Driver Education

The lack of evaluation information on injury-prevention interventions has resulted in the implementation of programs that are ineffective, or that even have adverse effects. A good example of this is high school driver education programs (47,128). Driver education had long been endorsed as an intervention to reduce adolescent morbidity and mortality due to motor vehicle crashes. Subsequent research, however, has not supported the use of driver education as it is currently delivered as a strategy to reduce motor vehicle crashes (47,78).

A driver education study, involving random assignment of students to an extensive driver education course, a shortened version of the course, or no course at all, found that although students in the shortened class experienced slightly fewer crashes than those who had not taken a class, no reduction in crashes was found for those who completed the longer version of the class (69). Other research indicates that driver education programs may actually result in higher rates of accidents among adolescent drivers, in part because they make it possible for adolescent drivers to obtain a license at a younger age, when they may be more likely to be in motor vehicle crashes (47,78). This occurs in States where taking driver education is a prerequisite for license at an earlier age (e.g., at age 16 instead of 17) (78). Another explanation of the low impact of high school driver education courses is that such courses provide novice drivers with inadequate behind-the-wheel experience (72,105). In response, some States have developed resource materials to assist parents in providing behind-the-wheel practice (72). An additional response, of course, would be for schools themselves to increase the amount of behind-the-wheel experience provided to students learning to drive.

Incentives

Safety restraints in automobiles have gained increasing acceptance over the past decade as a means of preventing or limiting the severity of injuries associated with motor vehicle crashes.[45] However, because adolescents have lower rates of use of safety belts than other age groups, special approaches to encourage adolescents to use safety belts seem to be necessary (6,47,109).

One such program, which used cash incentives to increase voluntary safety belt use, was implemented in Chapel Hill, North Carolina (18). Students' cars, identified by bumper stickers, were stopped randomly by study personnel as they entered the school parking lot and, if the occupants were wearing their safety belts, they were rewarded with $5 in cash. For students not driving to school, family cars were identified by bumper stickers. When the occupants were observed anywhere in the community to be wearing safety belts, the adolescent was rewarded with $5 the next day in school. The program involved soliciting donations from parents and private businesses, paired with extensive publicity at the high school (18). The program succeeded in increasing observed use of safety belts among adolescent males from just under 20 percent to close to 39 percent, and among adolescent females from 21 percent to 44 percent. The long-term effects of this program have not been assessed, so it is unknown whether increases in safety belt use by adolescents were maintained over time.

Combining Education and Incentives

The use of bicycle helmets has the potential to reduce head injury among cyclists. Helmets are relatively ineffective in most crashes that result in fatalities but have considerable potential for reducing the severity of injury in nonfatal crashes. Several studies have indicated that hardshell bicycle helmets are associated with as much as a tenfold reduction in the incidence of significant injuries to cyclists (27,64,120). Despite its demonstrated effectiveness in reducing the severity of injury, helmet use among adolescent bicyclists is low (6,73,120).

In Seattle, a communitywide education campaign was implemented in an effort to increase the use of bicycle helmets (26). The campaign included efforts to increase parental awareness of the need for helmets, to promote the use of helmets by children, and to reduce financial barriers to the purchase of helmets. To increase parental awareness of the need for helmets, the campaign included the use of a variety of media to promote the use of bicycle helmets, such as public service announcements on television and radio, press conferences, informational pamphlets distributed through physicians and health departments, and presentations to community groups. Efforts to promote use of helmets included the implementation of a bicycle safety program in public elementary schools, distribution of stickers promoting helmets to school and youth groups and at bicycling events, and the provision of incentives, such as baseball tickets, to children who wore helmets at bicycling events. Finally, in order to reduce financial barriers to the purchase of bicycle helmets, more than 100,000 discount coupons that lowered the cost of helmets to about $25 were distributed through physicians' offices, schools, youth groups, and community events; 1,300 helmets were sold at cost through the Parent-Teacher Association; and 1,300 helmets were donated to youth groups serving low-income children.

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[45] Airbags are discussed in the section on "Automatic Protection" below.

The effectiveness of the campaign was evaluated by comparing observed use of bicycle helmets before the campaign with observed use at various intervals after the start of the campaign. Observations were made at a variety of sites, including schools, bike trails, parks or playgrounds, and streets. To control for intervening events not related to the helmet campaign, observations of helmet use were also made in a demographically similar city (Portland, Oregon), where no organized effort to increase helmet use occurred during the study period. A total of 9,871 observations were made in the two cities of children estimated to be ages 5 to 15.

Results of the evaluation indicated significantly greater increases in the use of bicycle helmets in Seattle as compared with Portland (26). Use of helmets in Seattle increased from 4.6 to 14.0 percent 16 months after the campaign commenced, compared with an increase from 1.0 to 3.6 percent in Portland.[46] Both before and after the campaign, use was associated with race (whites were most likely to wear helmets), bicycle type (riders of geared bikes were more likely to use helmets), and site type (riders on bicycle paths were more likely to use helmets). In addition, children riding with companions (either other children or adults) who wore helmets were much more likely to wear helmets themselves, suggesting that peer and parental pressure may have an effect on use of helmets. Like other multifaceted prevention efforts described throughout this Report, it is difficult to disaggregate the effects of different elements of the Seattle prevention program. An evaluation that could disaggregate the effects of education from helmet distribution and other incentives, as well as assess the effectiveness of both strategies used together, would be useful, particularly if compared with a multifaceted intervention such as Seattle's.

Legislation

Another strategy for preventing or controlling accidental injuries is through legislation. Legislative measures are usually directed at changing either the environment or mandating specific behaviors. Examples include the motorcycle helmet and safety belt laws currently in effect in most States, or through local ordinances. In the first such effort in the country, for example, bicycle helmets were recently made mandatory for all bicycle riders in Howard County, Maryland, riding on county paths and streets (13,14). After pressure, however, the Howard County Council subsequently voted to amend the law to exempt riders over age 15 (14).

Laws and regulations can also be limited in their effectiveness and may be least effective for those who are at highest risk. For example, although 35 States plus the District of Columbia now have safety belt-use laws[47] (44,112), adolescents still have lower use of safety belts than adults or younger children (47,112). In 19 cities surveyed by the U.S. Department of Transportation's NHTSA, safety belt use by passengers ages 5 to 12 averaged 37 percent, with a range from 24 to 60 percent, while usage for passengers ages 13 to 19 averaged only 24 percent (112). As noted previously, in States where only minors are required to wear motorcycle helmets, many adolescents do not wear them.

Special Driver Licensing Restrictions for Adolescents

Nighttime driving curfews for adolescents, and changes in the minimum driving age have been shown to be effective in reducing adolescent vehicle crashes. States with nighttime curfews for 16-year-old drivers have reduced the fatalities in this age group by as much as 69 percent (122). Since half of fatal crashes involving 16- to 19-year-olds occur between 9 p.m. and 6 a.m., this measure has considerable potential for reducing injury.

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[46] These figures were adjusted for a variety of confounding variables, including race, type of bicycle, where bicyclist was observed riding, and with whom (if anyone) bicyclist rode. The unadjusted rates for Seattle were 5.5 percent use of helmets before the campaign, and 15.7 percent use after the campaign; unadjusted rates for Portland were 1.0 and 2.9 percent during the same period (26).

[47] All States have laws requiring that younger children be restrained by a child safety seat or (for older children) safety belt, but most of these laws affect only children under the age of 6 (112).

It has also been suggested that the age for obtaining a driver license be raised so that adolescents would be more mature before taking on the complex task of driving. This approach is a response to data demonstrating a disproportionate involvement of young drivers in severe and fatal crashes. However, the approach does not account for the fact that it takes time and practice to become a proficient driver, even at older ages. Another strategy that has been proposed is to develop a "graduated driver licensing system" whereby adolescents could actually start driving as early as age 14 under close parental supervision (111). The privileges of driving at night, and without parents present, would be phased in over the course of several years. This would allow a period of time for adolescents to gradually master the task of driving. Because this approach has yet to be tested, no conclusions can be drawn about the potential effectiveness of the approach in reducing adolescent involvement in motor vehicle crashes.

Requirements for School Bus Safety Belts

A number of school districts have moved to require safety belts in school buses, although the ratio of effectiveness to costs has been of concern[48] (11). As part of a cost-benefit analysis of safety belts in Texas school buses, estimates of the numbers of preventable school bus injuries and fatalities were calculated. It was calculated that 13 percent of serious injuries[49] to children ages 5 to 14 were preventable with the use of safety belts, as were 52 percent of injuries to adolescents ages 15 to 18.[50] Based on their analyses, the authors concluded that installation of safety belts in Texas was not cost-beneficial because the anticipated savings in direct medical care and legal costs and indirect costs (e.g., foregone earnings) did not offset the significant costs involved in retrofitting old buses and equipping new buses with safety belts.

A more recent and comprehensive study on school bus safety was conducted by the Transportation Research Board of the National Research Council (48). The analysis examined the effectiveness of safety belts in buses in preventing injury, assuming that only one-half of all students would actually wear the safety belts. It was estimated that, if all large school buses in the United States were equipped with safety belts, up to 1 life, 48 incapacitating injuries, 238 nonincapacitating injuries, and 665 injuries could be saved each year for a total annual cost of $43 million to equip the buses and maintain the safety belts. Based on these findings, the Committee concluded that a Federal standard mandating safety belts was unwarranted. Data from the U.S. Department of Transportation's NHTSA show that far more children are injured or killed in the process of boarding or leaving school buses than in school buses themselves. The Transportation Research Board recommended that, rather than equipping large school buses with safety belts, the safety of children riding school buses could be more effectively improved through driver training, pupil education, school bus monitors, safer school bus routing, improved mirrors, and improved signaling devices.

Automatic Protection

In contrast to voluntary efforts that rely on education to promote compliance, automatic protection measures typically are directed at changing consumer products or the environment. These efforts are frequently intended to provide protection by making changes that do not require individual action. Efforts may be voluntary, or required as the result of legislation or regulation. For example, Federal regulations now require a wide array of safety features on cars designed to reduce risks of injury. These include shatterproof windshields, energy-absorbing steering columns, and automatic safety belts or airbags. Environmental improvements, such as better street design, improved lighting, and installation of energy-absorbing materials at roadside sites where crashes are likely to occur, are also

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[48] Small, van-type school buses are currently required to have safety belts due to their similarity to cars and the lack of other protective features which are found in the larger buses (44).

[49] *Serious injuries* were defined as those receiving a score of 3 or greater on the Maximum Abbreviated Injury Scale (MAIS), a commonly used trauma severity scale (11). A MAIS score of 3 would reflect injuries such as major nerve laceration; multiple rib fracture; abdominal organ contusion; or hand, foot, or arm crush or amputation. A MAIS score of 6 would indicate that the injury was potentially fatal.

[50] Overall, however, children ages 5 to 14 received 84 percent of all injuries, and 83 percent of serious injuries.

Photo credit: Bethesda-Chevy Chase Rescue Squad

In general, automatic safety features such as airbags have been found to be more effective than education-based preventive measures in preventing injuries. Airbags are not yet required standard equipment in cars sold in the United States and are unlikely to be found in the older cars that adolescents apparently tend to use.

examples of efforts to provide automatic protection (2a,78).

In automobiles, passive restraint devices such as airbags or automatic safety belts are becoming increasingly available as a result of Federal regulation. These devices are each limited in ways different from standard shoulder-lap safety belts. Airbags, as they are currently constructed, are most effective in frontal collisions, which make up about 35 percent of all fatal car crashes (106). However, airbags are designed to supplement the use of safety belts. In order to enhance protection in frontal crashes, and to provide protection in other types of crashes, manually operated safety belts must be worn in conjunction with airbags. While the effectiveness of automatic safety belts is believed to be slightly less than traditional lap and shoulder belts, the use of automatic safety belts could have a substantial impact on injury reduction because, like airbags, they do not rely upon active compliance. In addition, the effectiveness of some automatic safety belts can be enhanced by the simultaneous use of a manually operated lap belt.

Federal Motor Vehicle Rule 208 required that all new cars sold in the United States after September 1989 must have an automatic crash protection system as standard equipment (28,113). However, this system could be either airbags or automatic safety belts. Some observers have noted that more expensive model cars have been the first to use airbags (121). (Honda, for example, will not make airbags standard until late 1993, and even then "a few low-priced, stripped cars may not have standard airbags" (121)). Anecdotal evidence suggests that adolescent drivers tend to use older, less expensive cars.

Treatment of Accidental Injuries Among Adolescents

Health service needs for acute and short-term treatment of accidental injuries differ by the type and severity of the injury sustained and, to a lesser degree, the developmental characteristics of the injured person.

Adolescents may present some special concerns for treatment. For example, medical personnel may have difficulty dealing with adolescents (22).[51] In addition, adolescents may have a need for additional types of services beyond the immediate medical treatment of the injury.

National data are not available, but there is some evidence reported in smaller studies that the treatment needs of adolescents differ from those of younger children. A study of persons under age 18 residing in upper Manhattan who sustained severe injuries that resulted in hospitalization, for example, found differences in the need for nonmedical services identified at the time of treatment. Adolescents ages 10 to 16 were more likely than younger children to have a need for psychological services,[52] and less likely to need child welfare services, according to information recorded on hospital charts (52).

There is also evidence that the pattern of injury differs by age. Data from emergency departments in Massachusetts indicated that adolescents ages 16 to 19 sustain more severe injuries than adolescents ages 13 to 15 (9). Adolescents ages 16 to 19 had more injuries requiring treatment in emergency rooms and higher rates of hospital admission. Data from 88 Los Angeles County emergency departments indicate that 28 percent of all trauma cases involved children and adolescents ages 1 to 19; adolescents ages 13 to 19 had twice the number of injuries requiring emergency services as children under the age of 13 (67). In addition, head injuries and abdominal injuries were found to be more common among children and adolescents ages 1 to 19 than among adults.

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[51] Also see ch. 15, "Major Issues Pertaining to the Delivery of Primary and Comprehensive Services to Adolescents," in Vol. III for a discussion of issues in the delivery of health services to adolescents.

[52] Adolescents were more likely to have received gun shot wounds or to be referred for ingestions of toxic substances.

The immediate treatment goal for all victims of moderate to severe injury is timely and appropriate prehospital and hospital care, regardless of age. Guidelines specific to the treatment of adolescents sustaining an injury do not exist; neither the American College of Emergency Medicine nor the American College of Surgery has a special protocol for adolescents who sustain injury. Because extremes of age are a factor in the initial management of a severely injured person, however, guidelines for the very young (under 8 years of age) and the elderly have been developed (4).

The issue of pediatric trauma care has received increased attention over the past decade (37,38). The American Pediatric Surgical Association and the American College of Surgeons, for example, have endorsed standards of care for critically injured pediatric patients (3,57). These standards of care recognize that children may have different treatment needs from adults. Children tend to sustain different types of injuries (e.g., head injuries), some types of injuries need to be managed differently (e.g., growth plate fractures must be properly managed to prevent limb shortening or deformity), children have smaller nutritional reserves and have different metabolic requirements, and there is a need for providing psychological support. There are no special guidelines for adolescent patients, however.

Photo credit: Bethesda-Chevy Chase Rescue Squad

After a committee of the American Medical Association's Council of Scientific Affairs found that there was an insufficient body of scientific knowledge relating to the specific needs of adolescents in emergency rooms to warrant a full report, the committee planned to monitor the issue.

Following a 1987 conference on unintentional injury among adolescents, the American Medical Association's (AMA) Council on Scientific Affairs reviewed issues surrounding the use of emergency room services by adolescents (15). The review was prompted by the concern that the unique health needs of adolescents might be neglected when it comes to procedures and training of personnel involved with emergency services. Unfortunately, the AMA review was limited by a lack of current data on adolescent use of emergency room services. Their analysis of clinical and developmental issues suggested that adolescents in emergency rooms had several requirements that might not be recognized by emergency room personnel: the need for confidential services; the need for physicians to identify hidden agendas (e.g., suicidal ideation in an 18-year-old male who has had a motorcycle accident); and the need for followup services. These needs were believed to apply to adolescents in all clinical settings, not just in emergency facilities, and the report suggested that "as more family practice, pediatric, and internal medicine programs include training in adolescent medicine, the care of adolescents in emergency rooms should improve" (15). It is not clear why specialists in emergency care were not included in this group. The most important conclusion seemed to be that the body of scientific knowledge relating to the specific needs of adolescents in emergency rooms "is not large enough currently to support a full [Council of Scientific Affairs] report." The Committee pledged to monitor the issue.

Major Federal Policies and Programs Pertaining to Accidental Injuries Among Adolescents

Wide-ranging injury prevention and control activities, related to both accidental and intentional injury, are conducted by the Federal Government. These activities involve a number of different agencies, each focusing on different aspects of the injury problem. The involvement of many agencies and activities has meant that attention has been given to many injury-related issues, but the overall Federal response has been fragmented (16).[53]

Some efforts have been made by DHHS and other agencies to coordinate Federal injury prevention and control efforts. Within the Centers for Disease Control's (CDC) Center for Environmental Health and Injury Epidemiology and Control, a Division of Injury Epidemiology and Control has been established to carry out a program of injury prevention research in conjunction with the U.S. Department of Transportation's NHTSA, with half of the funding to be directed to prevention and control of motor-vehicle-related injury (16,30,108). In fiscal year 1989, a Federal advisory committee for Injury Prevention and Control was established through the Bureau of Maternal and Child Health and CDC within DHHS, and NHTSA within the U.S. Department of Transportation (50). The charge of the Advisory Committee is to report on the state of injury prevention and set priorities for injury-related research; the first meeting of the advisory committee took place in September 1989 (50,87).

Various injury prevention and control activities of the Federal Government that include a focus on adolescents are described below.

U.S. Department of Health and Human Services

Centers for Disease Control

The Division of Injury Epidemiology and Control (DIEC) in CDC was created in 1986 through funding from NHTSA in an effort to better coordinate Federal efforts in the area of injury control. Prior to this, no central agency had Federal responsibility for reducing the incidence of injuries (47).

Funding for injury research activities at CDC has increased substantially over the past several years, although it is still quite low in comparison with the funding appropriated for heart disease or cancer. Appropriations for fiscal year 1989 were over $23 million, more than twice the budget for 1988 (103). Some programs that are funded through DIEC specifically target accidental and intentional injury among adolescents (e.g., motor-vehicle-related injuries, adolescent suicide or homicide); however, most do not. Although there is no budget line item specific to adolescents at DIEC, an estimated 15 percent of their funding, $3.3 million, is directed at adolescent issues (87).

The priorities of DIEC are to support intramural and extramural injury research and to support State and local injury prevention and control programs (87). Funded activities include the development of injury surveillance systems; collection and analysis of data; professional education and training; and research in acute care, biomechanics, epidemiology, and prevention (87,103). In addition, several multidisciplinary, injury prevention academic research centers are funded; these centers provide injury-related research, training, and technical assistance (87).

Health Resources and Services Administration

The Bureau of Maternal and Child Health in the Health Resources and Services Administration of DHHS has provided grants for injury prevention projects through the special projects of regional and national significance (SPRANS) program authorized under Title V of the Social Security Act. In fiscal year 1988, 23 SPRANS projects dealt with injury prevention among adolescents.[54] Children and adolescents are targeted through these programs. Projects have been funded to implement injury prevention programs in States, provide injury prevention services to Native American adolescents, and reduce drinking and driving among adolescents (49,94). Also funded through the Bureau of Maternal and Child Health are 12 demonstration projects designed to improve emergency medical services for children, including adolescents, although adolescents are not specifically targeted (95).

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[53] The general problem of fragmentation in the Federal approach to adolescent health is discussed at length in ch. 19, "The Role of Federal Agencies in Adolescent Health," in Vol. III.

[54] For further discussion, see ch. 19, "The Role of Federal Agencies in Adolescent Health," in Vol. III.

National Institute for Child Health and Human Development

The National Institute of Child Health and Human Development (NICHD) within the National Institutes of Health identifies the prevention of childhood injury as one of its priorities. In 1987, NICHD developed a plan for the development of research on the prevention of childhood injury (102). Initially funded projects focus on the prevention of injury among younger children rather than adolescents.

U.S. Department of Transportation's National Highway Traffic Safety Administration

NHTSA was established within the U.S. Department of Transportation in 1970 by the Highway Safety Act of 1970 (108). The mandate of NHTSA is to reduce deaths, injuries, and economic costs resulting from motor vehicle crashes. NHTSA's activities and research include efforts to stimulate activities to improve occupant protection, improve traffic law enforcement, improve the quality of emergency medical services, and establish and maintain a computerized traffic recordkeeping system (109).

Adolescents and young adults ages 15 to 24 are a major focus of the efforts of NHTSA to increase safety belt use and to reduce drunk and drugged driving-related traffic fatalities (109). NHTSA annually awards four to five research and demonstration grants targeted at 15- to 24-year-olds. Most of the past research conducted through NHTSA has focused on programs to educate young people about the risks of drinking and driving, and about safety belt usage.

Although most efforts of NHTSA are not age-specific, some efforts are directed at adolescents and young adults under the age of 21. In fiscal year 1988, NHTSA focused over $1 million on research and program activities designed to address highway safety problems of individuals ages 15 to 24 (109). The majority of programs have targeted high-school age adolescents. These include media campaigns addressing the issue of drunk driving, the development of high school assembly programs, and training programs for teachers to enhance their abilities to discuss alcohol and drug abuse issues with their students. In January 1990, NHTSA issued a report on a "Young Adult Highway Safety Plan," which focuses on the involvement of 15- to 24-year-olds in motor vehicle crashes (115). Areas of emphasis in the plan include adjudication, supervision, enforcement, legislation, licensing, school-based and extracurricular programs, and community- and work-based programs.

NHSTA also funds activities aimed at younger children which affect adolescents in the 10- to 14-year-old age group. These activities include Pedestrian Safety Programs that teach children ages 9 to 12 to deal with a complex traffic environment (44,56). In 1990, a Bicycle Education Program directed at children in grades 5 and 6 was in the planning stages; and a new instructional kit providing information on occupant protection to junior and middle school students, "The Car Club," was under development (44).

NHTSA also administers the Fatal Accident Reporting System, which gathers data on fatal vehicle accidents, and the National Accident Sampling System, which reports on fatal and nonfatal traffic crashes based on a sample of cases.

U.S. Consumer Product Safety Commission

The U.S. Consumer Product Safety Commission, in operation since 1973, is responsible for overseeing a wide range of consumer products to ensure that they are not hazardous to consumers (79). The commission uses several strategies for correcting consumer hazards, including issuing and enforcing mandatory standards, working with industry to develop voluntary standards, banning products, recalling products, conducting research on potential hazards of products, encouraging the development of new or improved voluntary standards, and conducting consumer information programs. For example, the commission was responsible for banning the sale of 3-wheel ATVs, and the request that industry develop a voluntary standard for 4-wheel ATV safety.

The commission also oversees the National Electronic Injury Surveillance System, which maintains information on emergency room visits for injuries that are related to consumer products (excluding motor vehicle, firearms, and several other classes of consumer products that are not under the jurisdiction of the commission).

Conclusions and Policy Implications

Accidental injuries are responsible for more deaths among U.S. adolescents than any other problem. In 1987, 10,658 U.S. adolescents ages 10 to 19 died as a result of accidental injury. Nearly two-thirds of these deaths resulted from motor vehicle crashes. U.S. adolescents are particularly susceptible to being involved in a motor vehicle crash when driving at night, or when driving after consuming alcohol.

Accidental injury *deaths*, however, represent just the "tip of the iceberg" of problems resulting from accidental injuries (58). Such injuries also cause temporary or permanent disabilities,[55] utilization of health care, school loss, and other problems. Sports and recreational activities, such as basketball and football, are a leading cause of *non*fatal injuries among adolescents.

Three basic approaches have been used for the prevention of accidental injuries. These are persuasion or education, legislation and regulation, and automatic protection. Positive incentives to encourage the use of protective equipment have also been tried and evaluated. Although results are not definitive, there appears to be some consensus that automatic protection (e.g., airbags in cars) is the most effective strategy for injury prevention, followed by laws and regulation, and that education and persuasion is the least effective strategy for injury prevention. In a few evaluations, however, programs that provide incentives to use protective devices (e.g., safety belts, bicycle helmets) have shown promise.

Over the past few years, there has been a significant increase in the amount of attention paid to injury research (62). Nonetheless, few reliable data exist on the causes of accidental injuries among adolescents, or on the effectiveness of interventions to prevent accidental injuries or limit their severity. Studies have primarily been descriptive in nature; rigorous effectiveness evaluations of prevention programs are particularly needed, as well as studies that seek to identify causal relationships so interventions may be developed (62).

There is little information on the long-term economic and other costs of injury (58). Neither the long-term monetary costs of injuries nor the sometimes devastating effects on families of seriously injured adolescents (e.g., financial and emotional stress) have been extensively assessed.[56]

The lack of comprehensive national data on accidental injuries among adolescents ages 10 to 18 makes it difficult to reach conclusions about which groups of adolescents are most at risk, and about the environmental characteristics that increase risk for accidental injury (17). This lack of data inhibits the development of a national strategy to address the problem of accidental injury. At the same time, it is critical that local jurisdictions have adequate injury surveillance systems so they can effectively identify problem areas, develop community responses that address their unique injury problems, and evaluate the effectiveness of their efforts (86).[57]

Evidence about the cause of injury is essential for determining appropriate interventions. While diagnostic information helps to distinguish skull fractures from concussions or lacerations from contusions, it does not identify factors pertinent to the prevention of the injury. Data about injury causation are essential to differentiate, for example, whether the skull fracture resulted from a fall, a motorcycle crash, or from playing football. Each of these causal factors implies the need for different preventive strategies (e.g., installation of a secure railing on a bridge, passage of motorcycle helmet laws, or changes in the design of football helmets). Inclusion in medical records of information on the causes of injuries would greatly enhance the utility of injury-related diagnostic information.

Data on the full spectrum of injuries, including those that do not result in hospitalization or death, are necessary to monitor the injury problem adequately, and to define appropriate countermeasures. Focusing only on injuries with the most severe outcomes results in a biased view of the injury problem. For example, although motor vehicle crashes are clearly the most important cause of severe injuries and death among adolescents, sports and recreational injuries actually account for many more injuries and are experienced by many more adolescents. A review of mortality data alone would not reveal the important role that sports and recreational activities play in adolescent injuries.

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[55] See ch. 6, "Chronic Physical Illnesses: Prevention and Services," in this volume for a discussion of the effects of chronic physical illnesses and disabilities on adolescents.

[56] Some of the effects of adolescent disability on families are discussed in ch. 6, "Chronic Physical Illnesses: Prevention and Services," in this volume.

[57] For example, a high number of pedestrian injuries along a particular stretch of road might indicate a need for better lighting, the need for a pedestrian walkway, or a need for warning signs, depending on the circumstances.

Another type of information that is lacking is the measurement of exposure. This is a difficult task that typically requires collection of data outside the health care delivery system. For example, in drawing appropriate conclusions about the risk of motor vehicle crashes involving adolescent drivers, it is important to document both the numbers of adolescent drivers and the extent to which they drive. This kind of exposure information serves as the denominator in calculating rates. It allows comparisons that take into account whether adolescents contribute disproportionately to motor vehicle crashes, or become involved in crashes at rates (per mile driven or time spent driving) that are no different from their parents or other adults. Some estimates of miles driven by adolescents can be obtained by transportation or insurance authorities; however, this kind of exposure information is not available for other types of injuries. Thus, for example, information on how many miles adolescents log on bicycles or ATVs or on how many adolescents know how to swim or swim well is not available.

Few good evaluation studies have been conducted on the effectiveness of specific injury prevention programs or intervention approaches. Although there appear to be many good ideas among injury prevention efforts, few have been well evaluated (50). It is critical that adolescent attitudes and beliefs about injury problems and various modes of injury prevention be considered when developing injury prevention interventions (65).

Although there is some evidence that adolescents with injuries may require some specialized treatment (e.g., psychological services, education on injury prevention) after injury, there is little information available on these needs, or on whether there is a need to train medical personnel in the special care of adolescents with injuries. Information is also lacking on long-term outcomes of accidental injury and the costs associated with injury. This requires a recordkeeping system with the ability to track injury victims over time and through various systems of health care, rehabilitation, and education services.

Funding for injury prevention research is scarce and has not been sufficient to permit well-designed intervention trials or solid evaluation studies. The new initiatives within CDC to fund research and intervention programs are directed, in part, at meeting this need. In proportion to the magnitude of the problem and funding of programs for other health problems, however, funding for these injury prevention programs is minimal. For example, despite the significant costs of injuries, both monetary and personal, overall funding for injury prevention and control is significantly less than that for cancer and cardiovascular diseases (58).

There is a critical need for a focus by Federal and local governments on the problem of accidental injury, including support for prevention research and programming, and for data systems to provide the information necessary to develop informed policies.

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Chapter 6

CHRONIC PHYSICAL ILLNESSES: PREVENTION AND SERVICES

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Chapter 6

CHRONIC PHYSICAL ILLNESSES: PREVENTION AND SERVICES

Introduction

Despite the common perception that U.S. adolescents are among the healthiest of Americans, evidence from a variety of sources discussed below indicates that many adolescents experience acute or chronic conditions that adversely affect their lives (see definitions in box 6-A). Acute conditions experienced by adolescents include injuries (e.g., sprains, lacerations, and fractures)[1] and illnesses ranging from colds and influenza to appendicitis. Chronic conditions include a wide spectrum of physical and mental health problems (e.g., hay fever, acne, cancer, diabetes, cardiovascular disease, epilepsy, orthopedic impairments due to injury, hearing impairments, visual impairments, emotional problems, and mental retardation). Nevertheless, in the 1988 National Health Interview Survey (NHIS) conducted by the U.S. Department of Health and Human Services (DHHS), 97.1 percent of 10- to 18-year-olds were reported to be in good to excellent health (105). NHIS data generally reflect parents' perceptions of adolescents health status,[2] but other evidence suggests that, for the most part, adolescents also regard themselves as healthy.[3]

This chapter raises some important issues related to the prevention and treatment of chronic physical health problems among U.S. adolescents.[4] First, it provides background on physical health problems of adolescents using a variety of data. Next it provides an overview of chronic physical illnesses and disabilities among adolescents and discusses the prevention and treatment of such problems. The chapter includes an in-depth discussion of cancer and of two physical health problems whose importance to adolescents is sometimes overlooked by parents, health care providers, and policymakers: acne and dysmenorrhea (painful menstruation). Finally, the chapter reviews major Federal programs pertaining to chronic physical illness and disability.

It is important to emphasize that this chapter is not designed to be a comprehensive assessment of all chronic physical health problems affecting adolescents. Rather, this chapter is intended to stimulate further discussion of issues such as how to assess the physical health status of adolescents; how to prevent and treat adolescents' chronic physical health problems; and what role the Federal Government can play in addressing the needs of adolescents with physical health problems. Other chapters in this volume cover a variety of specific adolescent physical health topics.[5] Chronic physical illnesses that affect adolescents and merit policy analysis but are not covered in depth in this chapter include asthma, diabetes, hypertension, chronic renal disease, seizures, and visual and hearing impairments (14,22,78).

It is also important to note that this chapter does not cover generic issues related to the delivery of health care services to adolescents. The delivery of primary and comprehensive care to adolescents, adolescents' health insurance status and financial

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[1] *Injuries* are harms or hurts inflected to the body by an external force (16a). Information on injuries among U.S. adolescents is presented in ch. 5, "Accidental Injuries: Prevention and Services," in this volume.

[2] NHIS has a number of limitations. As a household survey of a sample of the civilian noninstitutionalized population, it does not include individuals who are homeless or in institutions such as nursing homes or hospitals. For individuals under age 17, information is collected from a proxy, usually a parent or guardian. Older adolescents, 17- and 18-year-olds, may respond for themselves (105).

[3] A survey of Minnesota youth found, for example, that 91.4 percent of males and 85.9 percent of females believed that their health status was good to excellent (88).

[4] Following current mainstream usage, although not without occasional difficulty and ambiguity, this chapter defines *physical health problems* as problems "of or related to the body, and having material existence" and defines *mental health problems* as problems "pertaining to the mind." Information on mental health problems in adolescents is presented in ch. 11, "Mental Health Problems: Prevention and Services," in this volume. Some mental health problems have a physical basis, so the distinction between physical and mental health problems is somewhat arbitrary.

[5] For example, the prevalence, consequences, prevention, and short-term treatment of accidental injuries are covered in this volume in ch. 5, "Accidental Injuries: Prevention and Services"; nutrition and fitness problems, in ch. 7, "Nutrition and Fitness Problems: Prevention and Services"; dental problems, in ch. 8, "Dental and Oral Health Problems: Prevention and Services"; AIDS and other sexually transmitted diseases, in ch. 9, "AIDS and Other Sexually Transmitted Diseases: Prevention and Services."

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Box 6-A—Examples of Definitions of Chronic Illness and Disability

The literature on chronic illness and disability—for adolescents and for individuals of all ages—contains a wide array of definitions. Although some of the differences cannot be resolved in this chapter, several definitions are provided below as a guide to OTA's approach to assessing the prevalence and consequences of chronic illness and disability among adolescents.

For the purpose of the National Health Interview Survey (NHIS) conducted by the National Center for Health Statistics in the U.S. Department of Health and Human Services (DHHS), a *health condition* is a departure from a state of physical or mental well-being (104). A condition may be either an illness, an injury, or an impairment (see below). A condition is considered *acute* if it has lasted 3 months and is of sufficient consequence to have involved either a physician visit or at least 1 day of restricted activity; a condition is considered *chronic* if it has lasted 3 months or more or is a type of condition that normally lasts for at least [illegible] months (e.g., asthma, diabetes, heart conditions) (105).

NHIS defines a *disability* as any temporary or long-term reduction of a person's activity as a result of an acute or chronic condition (104). Disabilities are sometimes caused by illnesses (e.g., spina bifida, cerebral palsy, severe asthma) and sometimes caused by injuries or impairments. In NHIS, an *impairment* is a chronic or permanent defect, usually static in nature, that results from disease, injury, or congenital malformation (107a).

NHIS measures disability in several ways. One way is in terms of the number of "disability days," or days that a person's activity has been reduced. NHIS identifies several types of disability days. "Restricted-activity days" (the most inclusive and least descriptive measure) are any days on which a person restricts his or her usual activities for more than half the day because of illness or injury. NHIS measures four types of restricted-activity days: bed-disability days, work-loss days, school-loss days, and cut-down days. "School-loss days" are a type of restricted-activity day determined only for children ages 5 through 17; basically these days are any days on which a child did not attend school for at least half the day because of illness or injury.

NHIS also measures disability in terms of "limitation of activity due to chronic conditions" (107a). A limitation of activity refers to a long-term reduction in a person's capacity to perform the average kind or amount of activities associated with his or her age group. Individuals identified as having a chronic condition by NHIS are classified into categories that reflect the extent to which their activities are limited because of the conditions as follows: 1) unable to carry on the major activity for their age group (for children 5 to 17, major activity refers to school attendance; for individuals age 18 and over, it usually refers to a job, housework, or school attendance);

access to health services, consent and confidentiality issues affecting adolescents, and issues specific to the delivery of services to selected groups of adolescents (e.g., black, Hispanic, Asian-American, American Indian and Alaska Native, Native Hawaiian, rural, and poor adolescents) are topics addressed in Volume III of this Report.

Background on Physical Health Problems of Adolescents

There is no single comprehensive source of information about the physical health status of U.S. adolescents. Hence, a variety of sources must be used to identify the most important physical health problems facing adolescents. As noted in box 6-B, data available from the National Center for Health Statistics in DHHS include vital statistics data that provide information on causes of death for adolescents; data on reasons for visits to physicians' offices and for hospitalizations; data from household interview surveys that gather information on health problems, including those that result in limitations in activity; and data from epidemiologic surveys that include clinical examinations. Physical health concerns of particular importance to adolescents may be identified through surveys of young people that ask directly about their most pressing health concerns. Data from all of these sources are presented below to identify important health problems for U.S. adolescents.

Physical Causes of Death

As noted in box 6-B, national mortality data are compiled from State death certificates by the National Center for Health Statistics in DHHS on an ongoing basis. National mortality statistics include information on the cause of death and demographic

2) able to perform the basic activity but limited in the amount or kind of major activity performed; 3) not limited in major activity but limited in the kind or amount of other activities; and 4) not limited in activity.

OTA has sometimes broadly defined a chronic condition as a problem or disease that is lingering and lasting, as opposed to acute. In its 1982 report *Technology and Handicapped People*, OTA defined *disability* as a functional limitation, noting that a person with a disability has a "limited ability or an inability to perform one or more basic [daily] life functions (e.g., walking) at a level considered 'typical' " (92). Disabilities are often caused by impairments (92). According to OTA, an *impairment* is a physiological, anatomical, or mental loss or "abnormality" caused by accident, disease, or congenital condition (92). Visual impairments, for example, may limit the ability to see. A *handicap*, according to OTA, has to be defined within its environmental and personal contexts (92). Individuals are handicapped by their disability if it prevents them from performing one or more life functions at a "typical" level (92). "Handicaps are caused not by the disabilities themselves, but by the interaction between an individual's disability and the social environments in which the individual is functioning or expected to function" (92). Thus, an adolescent with poor vision has an impairment which reduces her ability to see (a disability). However, if corrective lenses can adequately correct her vision or if she can communicate effectively through the use of oral interpreters and braille, the visual impairment may not prevent the adolescent from performing in school, at home, or socially (i.e., it may not become a handicap).

In this chapter, *chronic illnesses* are defined as diseases that persist over a long period of time. According to a current medical dictionary, *a disease* is "any deviation from or interruption of the normal structure or function of any part, organ, or system, or combination thereof, of the body that is manifested by a characteristic set of symptoms and signs and whose etiology, pathology, and prognosis may be known or unknown" (16a).[1] *Disabilities* refer to limitations, usually long-term, in an individual's ability to perform basic activities of daily living. Mainstream distinctions between *physical* and *mental conditions* are adhered to in this Report, so that physical is generally defined as being "of or related to the body, and having material existence," whereas mental is defined as "pertaining to the mind." Some mental health problems have at least some biological component so the distinction between physical and mental health problems is rather arbitrary.[2]

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[1] Diseases are sometimes distinguished from *injuries*, which have been defined as "harms or hurts inflicted to the body by an external force" (16a). Information on injuries among U.S. adolescents is presented in ch. 5, "Accidental Injuries: Prevention and Services," in this volume.

[2] Information on selected mental health problems that affect U.S. adolescents is presented in ch. 11, "Mental Health Problems: Prevention and Services," in this volume.

characteristics of the decedent. Recent mortality statistics indicate that the most frequent *natural cause* of death among U.S. adolescents ages 10 to 19[6] is cancer.[7]

Reasons for Hospitalizations

The National Hospital Discharge Survey (NHDS), a survey sponsored by the National Center for Health Statistics, provides information on hospital discharges from a sample of short-stay non-Federal hospitals in the United States (see box 6-B). According to the 1987 NHDS, injury and poisoning are the problems that most frequently lead to hospitalization for U.S. males and females ages 10 to 18. Childbirth is the most frequent reason for hospitalization for U.S. females ages 15 to 18.[8] The types of physical illnesses that most frequently lead to hospitalization for U.S. males and females ages 10 to 18 are diseases of the respiratory system and diseases of the digestive system (see table 6-1).

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[6] To the extent possible, this OTA Report focuses on adolescents ages 10 through 18. It also attempts, whenever possible, to present evidence for smaller age groupings of adolescents (e.g., 10- to 14- and 15- to 18-year-olds). Sometimes, however, data were not readily available for these age groupings, and OTA used other age breaks. As a prominent example, the National Center for Health Statistics typically makes mortality data available at 5-year age breaks; thus, this section reports on information for 10- to 14-year-olds and 15- to 19-year-olds.

[7] *Natural causes* of death refer to causes such as illness, disease, or chronic conditions as opposed to *external causes* of death such as accidental injuries, homicide, or suicide. As shown in figure 5-1 in ch. 5, "Accidental Injuries: Prevention and Services," more adolescents die from external causes than from natural causes. These other problems are covered in other chapters of the Report. Age differences in causes of death in the U.S. population are covered in Vol. I of this Report.

[8] See ch. 10, "Pregnancy and Parenting: Prevention and Services," in this volume for a discussion of the physical and other consequences of childbearing among U.S. adolescents.

Box 6-B—Federal Sources of Data on the Physical Health of U.S. Adolescents[1]

National Center for Health Statistics

The National Center for Health Statistics (NCHS) of the U.S. Department of Health and Human Services (DHHS) is the primary Federal source of data on the physical health of U.S. adolescents. Through the National Vital Statistics System, NCHS collects and publishes data on births, deaths, marriages, and divorces in the United States (104). In addition, NCHS collects and publishes data from ongoing and special surveys such as the National Hospital Discharge Survey, the National Ambulatory Medical Care Survey, the National Health Interview Survey, the National Health Examination Survey, the National Health and Nutrition Examination Survey, and the National Survey of Family Growth. Some of these surveys are described below.

National Hospital Discharge Survey (NHDS)

NHDS is a continuing nationwide sample survey that gathers information each year on patients (excluding newborn infants) discharged from a sample of non-Federal short-stay and specialty hospitals located in the 50 States and the District of Columbia (108). The information collected includes data on personal information about the patient (e.g., birth date, race, sex, marital status), administrative information (e.g., dates of admission and discharge), and medical information (e.g., diagnosis and medical procedures performed). To be included in the sample, hospitals must have a minimum of six beds for patient use and average patient stays of less than 30 days.

Limitations—Relatively few adolescents are hospitalized each year. Because NHDS does not oversample for adolescents, the number of adolescents sampled in the survey is small. Consequently, NHDS does not provide reliable information on the incidence of hospitalization among adolescents for any but the most frequent reasons for hospitalization and does not allow for finer breakdowns such as by race, gender, or socioeconomic status. In addition, data are not reported using appropriate age breaks for adolescents.

National Ambulatory Medical Care Survey (NAMCS)

NAMCS is a continuing national probability sample survey of ambulatory medical encounters. It collects data on physician-patient encounters in the offices of a sample of non-federally employed physicians classified as "office-based, patient care physicians." Sample physicians are asked to complete a patient record information form for a systematic random sample of office visits occurring during a randomly assigned 1-week reporting period. Approximately 3,500 physicians provided data in 1985 (the last year for which data are available), submitting 71,594 patient record forms for patients of all ages. These data are used to develop estimates of the use of office-based visits by the U.S. population. Data are collected on patient characteristics (e.g., birth date, sex, race, ethnicity) and medical information (e.g., diagnostic services performed, diagnosis, reason for visit, medication provided or prescribed, and disposition of visit). Additional data are collected on the expected source of payment, referral status of the patient, and characteristics of the provider (e.g., specialty).

Limitations—NAMCS does not collect data on visits to hospital-based physicians. In addition, because there is no stratification of the sample on race or ethnicity and the sample sizes are quite small for racial and ethnic minorities, NAMCS does not present reliable information on office visits made by minority adolescents. The survey also includes information only on those individuals who seek care. Thus, adolescents who do not seek care for medical problems, or who use alternative sources of care, are not included in the survey. These adolescents may disproportionately include poor adolescents or those of nonwhite racial or ethnic backgrounds.

National Health Interview Survey (NHIS)

NHIS is a continuing nationwide survey of households (105,106). Data are collected from a probability sample of the civilian noninstitutionalized population residing in the United States on personal and demographic characteristics, restricted-activity days due to acute and chronic conditions, injuries, activity limitations due to chronic health conditions, and use of medical services. In 1988, 47,485 households, representing 122,310 persons, were sampled; 94.9 percent of these households were surveyed. The 1988 NHIS included a special focus on the health status of children and adolescents. Since 1985, the survey has oversampled black persons in order to increase the precision of estimates for this population. Data have been collected continuously since 1957.

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[1] The strengths and limitations of Federal data on U.S. adolescents' accidental injuries; nutrition and fitness problems; dental and oral health; cases of AIDS and sexually transmitted diseases; pregnancy; mental health problems; alcohol, tobacco, and drug abuse problems; delinquency; and homelessness are discussed in the relevant chapters of this volume. Also see ch. 18, "Issues in the Delivery of Health and Related Services to Selected Groups of Adolescents," in Vol. III of this Report and app. C, "Issues Related to the Lack of Information About Adolescent Health and Health and Related Services," in Vol. I of this Report.

Limitations—The NHIS sample does not include homeless persons, persons residing in institutions, or members of the armed services. Proxy interviews are generally used for all persons under age 17. Because the adults interviewed may be unaware of, or be reluctant to report, certain health problems or use of health services of adolescents, this information may not reflect the true health status of and utilization of services by adolescents in the household. The NHIS adolescent sample is too small to provide adequate measures of low prevalence physical conditions. Data are generally not reported using age groupings appropriate to describe adolescents.

National Health Examination Survey (NHES) and the National Health and Nutrition Examination Survey (NHANES)

National clinical epidemiological information on the health status of today's U.S. adolescents is not available. There are no recent national population surveys that provide clinical data about the health status of adolescents. One of the most comprehensive sources of national clinical epidemiological data on adolescents was NHES (94). The third cycle of this survey, which was conducted from 1966 to 1970, gathered information through interviews and physical examinations on the health status of a representative national sample of 6,768 adolescents ages 12 to 17. However, because this information is now over 20 years old, it is difficult to generalize to today's adolescents. There are likely to be many similarities in the health status of adolescents today and those of 20 years ago, but there may be significant differences as well.

NHANES was initiated as a successor to NHES in 1971 but has not yet collected comparable information on the health of U.S. adolescents. To measure the health status and characteristics of a sample of the civilian noninstitutionalized population of the United States, ages 1 to 74, NHANES uses interviews and, for a subsample, clinical examinations. NHANES I took place from 1971 to 1974, with a subsample of persons ages 25 to 74 selected for in-depth examinations. NHANES II began in 1976 and ended in 1980; this study oversampled persons 6 months to 5 years of age and those ages 60 to 74 (96,104). NHANES III is underway and has child health as a special focus (99). However, the adolescent sample in NHANES III will be small in comparison to the 1966-1970 NHES sample, and although blacks and Mexican Americans are being oversampled generally, the numbers of such adolescents included in NHANES III will be small. A total of 3,200 adolescents ages 12 to 19 will be included in the survey, including 1,120 black adolescents, 1,120 Mexican-American adolescents, and 980 white and other adolescents (17). Data collection for NHANES III is not expected to be completed until 1994. Thus, at this time, there is no good source of national clinical epidemiological information on the health status of today's adolescents.

Other Federal Agencies

Although NCHS is the primary source of national data on the physical health of U.S. adolescents, other DHHS agencies also collect and publish such data (104). The National Cancer Institute within the National Institutes of Health, for example, collects data from 11 population-based registries on people diagnosed with cancer through its Surveillance, Epidemiology, and End Results Program. That program is described below.

Surveillance, Epidemiology, and End Results (SEER) Program of Data Collection on Cancer

The SEER program provides information about the incidence of and the mortality due to malignant neoplasms in the United States (all ages included). Incidence data are based on information collected from a sample of 12 sites in the United States, plus one in Puerto Rico, representing approximately 13 percent of the total U.S. population. Participants in the program provide data annually to the SEER program. Mortality data are derived from mortality tapes obtained from NCHS, and include data on cancer mortality for the entire United States. The program began in 1972.

Limitations—SEER data are only limited if information is required on very specific cancers for smaller populations. In addition, although certain ethnic groups are oversampled (e.g., Japanese, Filipinos), small sample sizes make data on these groups somewhat unreliable.

Because relatively few U.S. adolescents are hospitalized each year for physical illnesses and thus few are represented in the NHDS sample, sample sizes for number of hospitalizations for most specific illnesses are too small to draw reliable conclusions about the specific diseases for which adolescents are hospitalized. Nonetheless, a more detailed review of the leading causes of hospitalization for 10- to 18-year-olds indicates that asthma, chronic diseases of the tonsils and adenoids, and acute

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Table 6-1—Rates of Different First-Listed Diagnoses[a] for U.S. Adolescents Ages 10 to 18 Discharged From Short-Stay Non-Federal Hospitals, 1987

	Number of first-listed diagnoses/1,000 inpatients[c]			
	Males		Females	
Diagnosis by ICD-9-CM category[b]	10 to 14	15 to 18	10 to 14	15 to 18
Injury and poisoning	24.8	33.1	16.3	8.2
Diseases of the digestive system	13.9	11.7	12.1	5.8
Diseases of the respiratory system	13.4	10.7	19.5	6.1
Mental disorders	6.9	14.3	8.8	7.1
Diseases of the nervous system and sense organs	5.9	—*	—*	—*
Diseases of the musculoskeletal system and connective tissue	5.2	5.8	—*	2.8
Diseases of the genitourinary system	5.2	—*	4.3	7.5
Endocrine, nutritional and metabolic diseases, and immunity disorders	4.7	3.4	—*	1.9
Infectious and parasitic diseases	4.0	—*	—*	1.8
Complications of pregnancy, childbirth	—*	—*	—*	12.1
Supplementary classification[d]	—*	—*	5.0	39.7

[a] In the National Hospital Discharge Survey, a *first-listed diagnosis* is the diagnosis listed first on the face sheet of a patient's medical record.

[b] ICD-9-CM refers to the International Classification of Diseases, 9th Revision, Clinical Modification, which is used to code morbidity data.

[c] Entries marked with an asterisk (*) did not meet the requisite standard of reliability.

[d] Females with deliveries are included under "Supplementary classifications."

SOURCE: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Center for Health Statistics, unpublished 1987 data from the National Hospital Discharge Survey, Hyattsville, MD, 1989.

appendicitis are among the physical illnesses most frequently leading to the hospitalization of U.S. adolescents (see table 6-2).

Reasons for Visits to Office-Based Physicians

As noted in box 6-B, the National Ambulatory Medical Care Survey (NAMCS) gathers information periodically on visits made by patients to a sample of non-Federal physicians in office-based practice (106). Inferences from NAMCS data are limited because the number of physicians sampled in the survey is small; furthermore, adolescents are one of the groups least likely to visit physicians.[9]

The most recent available NAMCS data are from 1985. According to these data, diseases of the respiratory system are the most frequent diagnosis for visits by adolescents to office-based physicians (17.0 percent of visits), followed by injury and poisoning (16.3 percent of visits), followed by diseases of the skin and subcutaneous tissue (9.9 percent of visits) (see table 6-3).

If one groups NAMCS data by more specific conditions, acne emerges as the most frequent diagnosis for an office visit for a physical problem (4.8 percent of visits) (see table 6-4).[10] Acne is particularly prevalent among older adolescents, who received a diagnosis of diseases of the sebaceous glands (e.g., acne) for 7.4 percent of visits; acne was the 12th most common diagnosis for younger adolescents (1.9 percent of visits).[11]

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[9] For a discussion of barriers to adolescents' use of physician services, see ch. 15, "Major Issues Pertaining to the Delivery of Primary and Comprehensive Health Services to Adolescents," in Vol. III.

[10] The need for a general medical examination is actually the most frequent specific principal diagnosis (5.8 percent of visits). The need for a general exam does not, however, reflect any specific health problem and is more likely to be part of general preventive health care.

[11] A preliminary analysis by OTA suggested some interesting discontinuities in the NAMCS data using year-by-year age breaks, but because of the lower reliability and interpretability of information based on fewer numbers of adolescents, it was not possible to look at information using these fine breakdowns. Age breaks of 10 to 14 years and 15 to 18 years were used based on the recommendations of the National Center for Health Statistics (60), and analysis of the patterns of visits to office-based physicians using the NAMCS data. Analysis of visit rates for adolescents of different ages indicated that the rate of visits for adolescent females increases at about age 15, most likely reflecting the increase in pregnancy-related visits. Pregnancies generally involve more than one visit per pregnant female during the course of a year (including postnatal visits). Thus, 10- to 14-year-old females have fairly similar visit patterns, as do 15- to 18-year-olds. No clear pattern emerged for males. The age break between 10- to 14-, and 15- to 18-year-olds, then, is driven by the utilization of physicians by females, which is in turn driven by pregnancy-related visits.

Table 6-2—Number of Different First-Listed Diagnoses for U.S. Adolescents Ages 10 to 18 Discharged From Short-Stay Non-Federal Hospitals, 1987

Diagnosis	NHDS diagnostic code	Estimated number of discharges[a] [b]			
		Males		Females	
		10 to 14	15 to 18	10 to 14	15 to 18
Other fractures	167	18,969	27,184	—*	—*
Appendicitis	91	16,843	16,727	—*	—*
Asthma	80	13,845	*	—*	—*
Other mental disorders	39	—*	21,174	13,485	24,190
Other injury	177	—*	15,307	—*	11,000
Lacerations/wounds	174	—*	14,847	—*	—*
Other psychoses	33	—*	11,570	—*	10,747
Chronic disease of tonsils and adenoids	75	—*	—*	20,681	16,387
Females with deliveries	184	—	—	—*	309,689
Other complications of pregnancy, childbirth, and the puerperium	137	—	—	—*	47,459
Other inflammatory diseases of the female pelvic organs	120	—	—	—*	20,532
Other disorders of the genital tract	125	—	—	—*	19,720
Other pregnancy with abortive outcome	128	—	—	—*	16,500
Poisoning by drugs, medicinal agents, and biological substances	178	—*	—*	—*	15,443
Other neurosis and personality disorders	35	—*	—*	—*	11,569

[a] Estimates with fewer than 60 sampled cases have been omitted from this table. Many of the specific diagnostic categories for males and females ages 10 to 14 and 15 to 18 had fewer than 60 sampled cases. Thus, many of the diagnostic categories listed here consist of aggregations of "other," rather than more specific categories.

[b] Entries marked with an asterisk (*) did not meet the requisite standard of reliability.

SOURCES: Discharges: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Center for Health Statistics, unpublished 1987 data from the National Hospital Discharge Survey, Hyattsville, MD, 1989. NHDS diagnostic codes: U.S. Department of Health and Human Services, Public Health Service, National Center for Health Statistics, "NHDS Diagnostic Recodes for ICD-9-CM," Hyattsville, MD, June 1987.

Table 6-3—Visits to Office-Based Physicians by U.S. Adolescents Ages 10 to 18: Number and Distribution by Diagnosis, 1985

Diagnosis by ICD-9-CM category[a]	ICD-9-CM code[a]	Number of visits in thousands	Percent distribution
All diagnoses		50,218	100.0
Diseases of the respiratory system	460-519	8,535	17.0
Injury and poisoning	800-999	8,177	16.3
Diseases of the skin and subcutaneous tissue	680-709	4,957	9.9
Diseases of the nervous system and sense organs	320-389	4,833	9.6
Infections and parasitic diseases	001-139	3,593	7.2
Diseases of the musculoskeletal system and connective tissue	710-739	2,280	4.5
Diseases of the genitourinary system	580-629	1,969	3.9
Diseases of the digestive system	520-579	1,607	3.2
Mental disorders	290-319	1,226	2.4
Endocrine, nutritional and metabolic diseases, and immunity disorders	240-279	587	1.2
Neoplasms	140-239	470	0.9
Diseases of the circulatory system	390-459	454	0.9
Supplementary classification	V01-V82	8,467	16.9
Symptoms, signs, and ill-defined conditions	780-799	1,424	2.8
Unknown diagnoses[b]		965	1.9
All other diagnoses[c]		673	1.3

[a] ICD-9-CM refers to the International Classification of Diseases, 9th Revision, Clinical Modification, which is used to code morbidity data.

[b] This includes blank diagnosis, noncodable diagnosis, and illegible diagnosis.

[c] This includes diseases of the blood and blood-forming organs (280-289); complications of pregnancy, childbirth, and the puerperium (630-676); congenital anomalies (740-759); and certain conditions originating in the perinatal period (760-779).

SOURCE: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Center for Health Statistics, unpublished 1985 data from the National Ambulatory Medical Care Survey, Hyattsville, MD, 1989.

Table 6-4—Visits to Office-Based Physicians by U.S. Adolescents Ages 10 to 18: Number and Distribution by the 15 Most Common Principal Diagnoses, 1985

Rank	Most common principal diagnosis by ICD-9-CM category[a]	Number of visits in thousands	Percent of all adolescent visits
1	General medical examination	2,914	5.8
2	Diseases of sebaceous glands[b]	2,394	4.8
3	Acute pharyngitis	1,822	3.6
4	Acute upper respiratory infections of multiple or unspecified sites	1,627	3.2
5	Normal pregnancy	1,548	3.1
6	Earache or ear infection	1,368	2.7
7	Suppurative and unspecified otitis media	1,236	2.5
8	Disorders of refraction and accommodation	1,197	2.4
9	Other diseases due to viruses and chlamydiae	1,139	2.3
10	Certain adverse effects not elsewhere classified[c]	1,086	2.2
11	Contact dermatitis and other eczema	1,063	2.1
12	Health supervision of infant or child	1,000	2.0
13	Acute tonsillitis	799	1.6
14	Asthma	704	1.4
15	Open wound of other and unspecified site	659	1.4

[a] ICD-9-CM refers to the International Classification of Diseases, 9th Revision, Clinical Modification, which is used to code morbidity data.

[b] Chiefly acne other than varioliformis.

[c] Primarily allergy, unspecified.

SOURCES: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Center for Health Statistics, unpublished 1985 data from the National Ambulatory Medical Care Survey, Hyattsville, MD, 1989.

Findings From National Population-Based Surveys

Judgments about the importance of particular health problems derived from health care utilization data are limited in that they do not reflect the health concerns of individuals who do not use the health care system.[12] Such concerns are more likely to be reflected in population-based surveys. As noted in box 6-B, the National Center for Health Statistics has used two types of population-based surveys. The National Health Interview Survey (NHIS) collects data from a sample of the civilian noninstitutionalized U.S. population through personal household interviews (108). The National Health and Nutrition Examination Survey (NHANES)—formerly the National Health Examination Survey (NHES)—collects health-related data by means of direct physical examinations, clinical and laboratory tests, and related measurement procedures (108). The latter two surveys have been conducted more rarely than NHIS, and no adequate sample of adolescents was included in NHANES I or II. (NHANES III is collecting some adolescent-specific data, but the results are not expected until 1994.)

National Health Interview Survey (NHIS)

NHIS collects information on both acute conditions and chronic conditions. A physical or mental condition is considered "acute" for purposes of NHIS if: 1) it was first noticed 3 months before the reference date of the interview; and 2) it is not one of the conditions considered chronic regardless of the time of onset. To be counted in NHIS data, an acute condition must also have been of sufficient consequence to have been associated with at least 1 restricted-activity day or at least one visit to a doctor. A physical or mental condition is considered "chronic" for purposes of the NHIS if: 1) the respondent indicates it was first noticed more than 3 months before the reference date of the interview and it exists at the time of the interview, or 2) it is a type of condition that ordinarily has a duration of more than 3 months. Examples of physical conditions that are considered chronic regardless of their time of onset are diabetes, heart conditions, emphysema, and arthritis.

Acute Conditions—The impact of acute conditions on adolescent health is measured in terms of restricted-activity days (overall and due to specific problems) and school-loss days (overall and due to

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[12] As noted in box 6-B, available health services utilization data are limited in other ways, particularly with respect to adolescent health.

Table 6-5—Number of Restricted-Activity Days[a] Associated With Acute Conditions[b] per 100 U.S. Adolescents for Noninstitutionalized Adolescents Ages 10 to 18, by Sex, Age, and Type of Condition, 1988

Type of acute condition	Both sexes, ages 10 to 18	Number of restricted-activity days/100 adolescents in age group[c]					
		Males			Females		
		10 to 18	10 to 14	15 to 18	10 to 18	10 to 14	15 to 18
All acute conditions	659.6	606.7	629.2	580.6	714.4	664.7	770.7
Infective and parasitic diseases	121.7	117.9	129.6	104.3	125.6	156.0	91.1
Common childhood diseases	25.7	—*	—*	—*	—*	—*	—*
Intestinal virus, unspecified	—*	—*	—*	—*	—*	—*	—*
Viral infections, unspecified	28.0	—*	—*	—*	—*	—*	—*
Other	57.5	55.6	—*	—*	59.4	—*	—*
Respiratory conditions[d]	307.0	287.2	325.7	242.3	327.6	319.6	336.7
Common cold	72.5	71.3	83.2	57.4	73.7	81.6	64.8
Other acute upper respiratory infections	35.4	35.6	—*	—*	35.3	—*	—*
Influenza	175.0	152.2	169.0	132.5	198.7	179.5	220.6
Digestive system conditions[e]	23.3	—*	—*	—*	—*	—*	—*
Injuries[f]	119.5	133.5	94.9	178.4	104.9	92.7	118.7
Fractures and dislocations	40.8	51.7	—*	—*	—*	—*	—*
Sprains and strains	29.4	—*	—*	—*	—*	—*	—*
Other current injuries	19.2	—*	—*	—*	—*	—*	—*
Selected other acute conditions[g]	74.8	39.4	—*	—*	111.5	—*	174.9
Delivery and other conditions of pregnancy and puerperium	24.7	—	—	—	50.3	—*	107.4

[a] For the purposes of the National Health Interview Survey (NHIS), *restricted-activity day* is any day on which a person restricts his or her usual activities for more than half a day because of an illness or an injury (i.e., a school-loss, work-loss, or cut-down day or a bed-disability day). Restricted-activity days are measures used for both acute and chronic conditions. This table shows only the restricted-activity days associated with acute conditions.

[b] A condition is considered "acute" for the purposes of NHIS if it has lasted under 3 months, is not a condition considered chronic regardless of time of onset, and is of sufficient consequences to have been associated with either at least one doctor visit or at least 1 day of restricted activity.

[c] Entries marked with an asterisk (*) did not meet the requisite standard of reliability.

[d] Categories not shown because of low reliability of estimates include acute bronchitis, pneumonia, and "other" respiratory conditions.

[e] This includes dental conditions; indigestion, nausea, and vomiting; and other digestive conditions. No specific category had enough sampled cases to be considered reliable.

[f] Categories not shown because of low reliability of estimates include "open wounds and lacerations" and "contusions and superficial injuries."

[g] Categories not shown because of low reliability of estimates include eye conditions, acute ear infections, other ear conditions, acute urinary conditions, disorders of menstruation, other disorders of the female genital tract, skin conditions, acute musculoskeletal conditions, headache (excluding migraine), and unspecified fever.

SOURCE: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Center for Health Statistics, unpublished 1988 data from the National Health Interview Survey, Hyattsville, MD, 1990.

specific problems). As noted in box 6-A, a restricted-activity day is any day on which a person restricts his or her usual activities for more than one-half day because of an illness or injury (106).[13] A school-loss day, a type of restricted-activity day calculated for 5- to 17-year-olds, is any day on which a child did not attend school for half a day because of illness or injury.

The 1988 NHIS found the acute conditions causing the highest numbers of restricted-activity days among noninstitutionalized adolescents ages 10 to 18 were acute respiratory conditions (particularly influenza), followed by infective and parasitic diseases (see table 6-5). Acute respiratory conditions are also responsible for over half of the school-loss days associated with acute conditions (see table 6-6). Other acute conditions that cause relatively high numbers of restricted-activity and school-loss days among U.S. adolescents are infective and parasitic diseases and injuries.

Although the reported average rate of restricted-activity days due to acute conditions for younger (10- to 14-year-old) adolescents is similar to that for older (15- to 18-year-old) adolescents, there are some interesting age differences by condition and general differences by sex and race. As shown in table 6-5, younger adolescents are more likely to have restricted-activity days due to acute physical illness (respiratory conditions, infective and parasitic diseases), and older adolescents are more likely

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[13] "*Restricted-activity days*" are unduplicated counts of the following: 1) bed-disability days, during which a person spent more than half a day in bed because of illness or injury: 2) work-loss days, during which a currently employed person 18 years of age and over missed more than half a day from a job or business; 3) school-loss days, during which a student 5 to 17 years of age missed more than half a day from the school in which he or she was currently enrolled; and 4) cut-down days, during which a person cuts down for more than half a day on the things he or she usually does. Note that a "day of restricted activity" due to an acute condition is not the same as a "limitation in activity" caused by a chronic condition (105).

Table 6-6—Number of School-Loss Days[a] Associated With Acute Conditions[b] per 100 U.S. Adolescents for Noninstitutionalized Adolescents Ages 10 to 17, by Sex, Race, Family Income, and Types of Condition, 1988

	Number of school-loss days/100 adolescents ages 10 to 17[c]								
		Sex		Race		Family income			
Type of acute condition	All ages 10 to 17	Male	Female	White	Black	Less than $10,000	$10,000-$19,999	$20,000-$34,999	$35,000 or more
All acute conditions	379.6	362.8	397.1	399.9	302.8	483.1	403.2	419.3	349.1
Infective and parasitic diseases[d]	79.9	82.6	76.9	84.8	—*	—*	—*	84.3	83.8
Common childhood diseases	22.0	—*	—*	—*	—*	—*	—*	—*	—*
Viral infections, unspecified	17.3	—*	—*	20.5	—*	—*	—*	—*	—*
Other	33.0	36.7	—*	39.3	—*	—*	—*	—*	42.8
Respiratory conditions[e]	210.0	199.8	220.7	226.2	137.8	235.1	196.2	236.5	200.2
Common cold	48.4	47.8	49.1	48.9	—*	—*	—*	61.7	—*
Other acute upper respiratory infections	23.7	—*	—*	26.7	—*	—*	—*	—*	—*
Influenza	122.3	110.0	135.3	132.2	—*	151.5	119.0	133.3	123.1
Digestive system conditions[f]	15.4	—*	—*	—*	—*	—*	—*	—*	—*
Injuries[g]	32.3	42.4	—*	35.5	—*	—*	—*	—*	—*
Selected other acute conditions[h]	34.3	22.2	46.9	29.8	—*	—*	—*	—*	—*
All other acute conditions	—*	—*	—*	—*	—*	—*	—*	—*	—*

[a] For the purposes of the National Health Interview Survey (NHIS), a *school-loss day* is a day on which a student 5 to 17 years of age missed more than half a day from the school in which he or she was currently enrolled. A school-loss day is one type of restricted-activity day.

[b] A condition is considered "acute" for the purposes of NHIS if it has lasted under 3 months, is not a condition considered chronic regardless of time of onset, and is of sufficient consequences to have been associated with either at least one doctor visit or at least 1 day of restricted activity.

[c] Entries marked with an asterisk (*) did not meet the requisite standard of reliability.

[d] Categories not shown because of insufficient reliability include: intestinal virus, unspecified.

[e] Categories not shown because of insufficient reliability include: acute bronchitis, pneumonia, "other" respiratory conditions.

[f] Categories not shown because of insufficient reliability include: dental conditions; indigestion, nausea, and vomiting; and other digestive conditions.

[g] Categories not shown because of insufficient reliability include: fractures and dislocations; sprains and strains; open wounds and lacerations; contusions and superficial injuries; other current injuries.

[h] Subcategories are not shown because of insufficient reliability.

SOURCE: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Center for Health Statistics, unpublished 1988 data from the National Health Interview Survey, Hyattsville, MD, 1990.

to have restricted-activity days due to injuries and pregnancy-related causes. Female adolescents in general (but particularly older female adolescents) are more likely than males to have days of restricted activity due to acute conditions; perhaps not surprisingly, this phenomenon is largely due to pregnancy.[14] Black adolescents are less likely (506.6 days per 100 10- to 18-year-olds per year) than white adolescents (704.4 days per 100 10- to 18-year-olds per year) to have restricted-activity days reported for acute conditions.[15]

School-loss days and restricted-activity days generally show similar age, sex, and race patterns, except that 10- to 14-year-old females have fewer school-loss days than their male counterparts (107). As shown in table 6-6, adolescents in families with annual incomes less than $10,000 have higher rates of school-loss days (483.1 days per 100 adolescents per year) than adolescents in families with annual incomes of $35,000 or more (349.1 days per 100 adolescents per year). Differences in school-loss days by family income level are more marked for adolescents ages 10 to 14 than for those ages 15 to 17, although they follow the same general pattern.[16]

Chronic Conditions—The 1988 NHIS found the most frequently reported chronic physical conditions for noninstitutionalized U.S. adolescents ages 10 to 18 were hay fever or allergic rhinitis without asthma, chronic sinusitis, acne, asthma, deformity or orthopedic impairment, chronic bronchitis, chronic disease of the tonsils or adenoids, dermatitis, and

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[14] See ch. 10, "Pregnancy and Parenting: Prevention and Services," in this volume for a discussion of adolescent pregnancy.

[15] Interestingly, the number of restricted-activity days per 100 persons per year increases with age for black adolescents and decreases for white adolescents. Because of small sample sizes, it is not possible to be specific about race differences for specific conditions.

[16] The average number of school-loss days per 100 10- to 14-year-olds per year reported by families with annual incomes less than $10,000 was 491.9 days; by families with annual incomes from $10,000 to $19,999 was 379.8 days; by families with annual incomes from $20,000 to $34,999 was 402.0 days; and by families with incomes of $35,000 or more was 340.7 days. See ch. 18, "Issues in the Delivery of Services to Selected Groups of Adolescents," in Vol. III for a discussion of the health problems of adolescents in poor and near-poor families.

Table 6-7—Prevalence Rate for 20 Leading Chronic Physical Conditions[a] Among Noninstitutionalized U.S. Adolescents Ages 10 to 18, 1988

	Number of chronic conditions/ 1,000 persons[b]		
	Ages 10 to 18	10 to 14	15 to 18
Hay fever or allergic rhinitis without asthma	91.2	92.4	89.8
Chronic sinusitis	89.6	82.9	97.4
Acne	61.7	34.6	92.9
Asthma	58.1	62.1	53.5
Deformity or orthopedic impairment	54.2	39.3	71.3
Back	26.6	16.6	38.1
Lower extremities	26.5	23.0	30.5
Chronic bronchitis	38.8	33.8	44.5
Chronic disease of tonsils or adenoids	31.1	29.6	32.9
Dermatitis	31.1	32.3	29.8
Migraine headaches	28.6	27.4	29.9
Heart disease	22.4	20.4	16.1
Heart murmurs	16.7	19.8	13.1
Hearing impairment	20.7	19.7	22.0
Visual impairment	18.9	16.5	21.6
Trouble with ingrown nails	17.6	10.1	26.4
Color blindness	12.3	10.4	14.6
Trouble with dry, itching skin	10.1	—*	12.8
Speech impairment	9.0	11.3	—*
Diseases of female genital organs	7.1	—*	13.0
Anemias	6.2	—*	—*
Arthritis	4.7	—*	—*
High blood pressure	4.5	—*	—*

[a] A physical or mental condition is considered "chronic" for purposes of the National Health Interview Survey if it has lasted more than 3 months or is a type of condition that ordinarily lasts more than 3 months (e.g., diabetes, heart conditions, emphysema, or arthritis).

[b] Entries marked with an asterisk (*) did not meet the requisite standard of reliability.

SOURCE: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Center for Health Statistics, unpublished 1988 data from the National Health Interview Survey, Hyattsville, MD, 1990.

migraine headaches (see table 6-7). Other physical chronic conditions with a rather high reported prevalence among adolescents were heart disease, hearing impairments, and visual impairments (see table 6-7).

Each person identified by NHIS as having a chronic physical or mental condition is classified according to the extent to which his or her activities are reported as limited.[17] As shown in table 6-8, the 1988 NHIS found that 93.2 percent of U.S. adolescents were reported to have no activity limitation due to a chronic physical or mental condition; 6.8 percent were reported to have some activity limitation. The 6.8 percent with activity limitation due to a chronic condition included 0.6 percent of U.S. adolescents who were unable to perform a major activity (e.g., attending school); 4.3 percent who were limited in the amount or kind of major activity; and 1.9 percent who were limited but not in major activity (see table 6-8). Among adolescents with chronic conditions, there was very little difference in reported degree of activity limitation by age, sex, race, or place of residence. However, there were some differences by income, with a larger proportion of adolescents (94.9 percent) in higher income families than in the lower income families (e.g., 90.2 percent in families with annual incomes under $10,000) free of an activity limitation (107).

Newacheck conducted an in-depth analysis of 1984 NHIS data by type of serious chronic disorder (62). This analysis revealed that 75 percent of U.S. adolescents ages 10 to 18 with a reported limitation of activity due to a chronic disorder or disorders had a disorder in one of the five following categories:

- mental disorders (including mental retardation, psychoses, and substance dependence syndromes), 32 percent;
- respiratory conditions (e.g., asthma), 21 percent;
- diseases of the musculoskeletal system or connective tissue (e.g., arthritis or acquired limb deformities), 15 percent;
- diseases of the nervous system (e.g., multiple sclerosis, cerebral palsy, or epilepsy), 6 percent; and
- diseases of the ear and mastoid process (e.g., hearing impairments), 4 percent.

National Health Examination Survey (NHES)

A compelling source of information on the health status of any group is a population-based survey that includes clinical examinations by health care providers. Unfortunately, the last such survey to include sufficient numbers of adolescents for meaningful analysis was the NHES completed in 1970 by the U.S. Department of Health, Education, and Welfare (now the U.S. Department of Education and DHHS)

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[17] Note that limitations of activity associated with chronic conditions differ from restricted-activity days discussed above. NHIS measured restricted-activity days for both acute and chronic conditions, but limitations of activity only for chronic conditions.

Table 6-8—Distribution of Noninstitutionalized U.S. Adolescents Ages 10 to 18 by Degree of Activity Limitation Due to a Chronic Physical or Mental Condition and Socioeconomic Characteristics, 1988

Characteristic	Total[a]	Percent with no activity limitation	Percent with activity limitation[a]	Percent with limitation in major activity[b c]	Percent unable to carry on major activity[b c]	Percent limited in amount or kind of major activity[b c]	Percent limited, but not in major activity[b c]
All 10- to 18-year-olds	100.00	93.2	6.8	4.8	0.6	4.3	1.9
Age:							
10- to 14-year-olds	100.0	93.2	6.5	5.3	—*	4.9	1.6
15- to 18-year-olds	100.0	93.3	6.7	4.4	0.9	3.5	2.3
Sex and age:							
Male							
All ages (10 to 18)	100.0	92.7	7.3	5.4	—*	4.9	1.9
10- to 14-year-olds	100.0	92.3	7.7	6.1	—*	5.8	1.6
15- to 18-year-olds	100.0	93.0	6.9	4.6	—*	3.9	2.3
Female							
All ages (10 to 18)	100.0	93.8	6.2	4.3	—*	3.6	1.9
10- to 14-year-olds	100.0	94.1	5.9	4.4	—*	4.0	1.5
15- to 18-year-olds	100.0	93.5	6.5	4.1	—*	3.2	2.3
Race and age:							
White							
All ages (10 to 18)	100.0	93.0	7.0	4.9	0.6	4.4	2.0
10- to 14-year-olds	100.0	92.9	7.1	5.4	—*	5.1	1.7
15- to 18-year-olds	100.0	93.2	6.8	4.4	—*	3.6	2.4
Black							
All ages (10 to 18)	100.0	93.2	6.8	5.1	—*	4.4	—*
10- to 14-year-olds	100.0	93.3	6.7	5.3	—*	4.3	—*
15- to 18-year-olds	100.0	93.2	6.8	—*	—*	—*	—*
Family income and age:							
Under $10,000							
All ages (10 to 18)	100.0	90.2	9.8	7.8	—*	6.9	—*
10- to 14-year-olds	100.0	88.8	11.2	9.5	—*	9.2	—*
15- to 18-year-olds	100.0	91.5	8.5	—*	—*	—*	—*
$10,000 to $19,999							
All ages (10 to 18)	100.0	91.1	8.9	6.6	—*	6.0	—*
10- to 14-year-olds	100.0	91.5	8.5	6.6	—*	6.2	—*
15- to 15-year-olds	100.0	90.5	9.5	6.5	—*	5.7	—*
$20,000 to $34,999							
All ages (10 to 18)	100.0	92.9	7.1	5.0	—*	4.3	2.1
10- to 14-year-olds	100.0	93.5	6.5	4.8	—*	4.4	—*
15- to 18-year-olds	100.0	92.0	8.0	5.2	—*	4.1	—*
$35,000 or more							
All ages (10 to 18)	100.0	94.9	5.1	3.5	—*	3.1	1.6
10- to 14-year-olds	100.0	94.4	5.6	4.1	—*	4.0	—*
15- to 18-year-olds	100.0	95.5	4.5	2.7	—*	—*	—*
Geographic region:							
Northeast	100.0	94.1	5.9	4.3	—*	3.9	—*
Midwest	100.0	92.6	7.3	5.5	—*	5.0	1.8
South	100.0	93.0	7.0	5.0	—*	4.4	2.0
West	100.0	93.5	6.5	4.2	—*	3.6	2.2
Place of residence:							
Metropolitan statistical area	100.0	93.5	6.5	4.7	0.6	4.1	1.8
Central city	100.0	93.7	6.3	4.7	—*	4.0	1.6
Not central city	100.0	93.3	6.7	4.7	—*	4.2	2.0
Not metropolitan statistical area	100.0	92.5	7.5	5.3	—*	4.8	2.2

[a] Note that the numbers in horizontal rows do not add up to 100 percent. The reason is that the last four columns show breakdowns of the overall percentage with activity limitations shown in the third column. In addition, numbers in some rows may not add up because of rounding.

[b] *Major activity* (or usual activity) refers to the principal activity of a person or of a person of his or her age-sex group (e.g., school attendance, working at a job).

[c] Entries marked with an asterisk (*) did not meet the requisite standard of reliability.

SOURCE: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Center for Health Statistics, unpublished 1988 data from the National Health Interview Survey, Hyattsville, MD, 1990.

(94,95).[18] Because they are so old, estimates of adolescents' physical health problems based on NHES may not pertain to the health status of contemporary adolescents. Still, the data from NHES suggest that the physical health of American adolescents may not be as positive as is often assumed. Most troubling is the NHES' finding that *more than one adolescent out of five (about 22 percent) had "some illness, deformity, or handicap . . . affecting normal growth, development, or function—cardiovascular, neurological, musculoskeletal, or other"* (94). NHES found that the proportion of adolescents ages 12 to 17 with physical health problems was greater than the proportion of younger children (ages 6 to 11[19]) with physical health problems.

NHES also recorded information by race, region, and family income. This survey found no differences in physical health status by race. Adolescents living in the South had more health problems than adolescents from other regions, and adolescents of lower income had more health problems than adolescents from families with higher incomes (94).

Physical Health Problems From the Perspective of Adolescents

Adolescents themselves are rarely asked to identify the physical (or other) health problems that they believe are most important. Even in adolescent health surveys, adolescents are infrequently asked to rate the importance of various health issues. The National Adolescent Student Health Survey conducted by a consortium of groups funded partially by the Federal Government in 1987, for example, questioned more than 11,000 8th and 10th graders nationwide but failed to ask respondents to identify the most important physical health issues for adolescents (4). Adolescents were asked to identify physical health issues in the Minnesota Adolescent Health Survey of over 36,000 Minnesotan students in grades 7 through 12, but reports of the Minnesota survey results emphasized nonphysical concerns (88).[20] Thus, data are very limited on the specific physical health concerns identified as most important by adolescents.

Some evidence suggests, however, that adolescents do not always agree with adults on what adolescents' most important health needs are. A Canadian study that asked a random sample of 1,000 adolescents ages 12 through 20 and 100 school-based public health nurses and school psychologists or counselors to rate the seriousness and prevalence of a variety of health problems among adolescents found differences in the perceptions of adolescents and the professionals (32). The health providers identified menstrual problems, acne, and headaches as common, but not serious, problems; pregnancy, venereal diseases (i.e., sexually transmitted diseases), and chronic health problems as serious but not common; and nervousness or emotional, school-related, and birth control problems as serious and common problems. Adolescents concurred with the health providers that menstrual problems and acne were common complaints, but few of the adolescents identified birth control problems, venereal diseases, or chronic health problems as significant. The professionals cited substance abuse (alcohol and drugs) and sexual problems as the most serious, but relatively uncommon, psychosocial problems. Adolescents reported fairly high rates of alcohol use (49.0 percent), drug use (15.1 percent), and sexual intercourse (22.1 percent) but did not perceive these to be problems.

Another study conducted in Canada asked adolescents ages 13 to 18 what issues they would like to discuss or have covered when they visit primary care physicians and how often the issues were actually discussed during a visit (50). This study was somewhat flawed in that it asked adolescents both questions simultaneously; the results would have been more valid if the responses had been independent.

Nonetheless, the results of this Canadian study are consistent with the results of previous studies that

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[18] Pediatricians examined 12- to 17-year-olds using a standardized physical examination for problems with eyes, ears, nose, and throat; goiter; musculoskeletal and limited neurological evaluation; cardiovascular examination; grading of facial acne; assessment of sexual maturation through a genital examination; and an appraisal of nutrition. The examination did not include an evaluation of mental health problems, except for an assessment of mental retardation by appearance.

[19] OTA included 10- and 11-year-olds in the adolescent age group, but NHES aggregated many of its findings by two age groups: 6- to 11-year-olds and 12- to 17-year-olds. Fewer 6- to 11-year-olds than 12- to 17-year-olds were found to have "significant abnormal findings" on examination by the physician (one in eight 6- to 11-year-olds v. one in five 12- to 17-year-olds). Much of the difference between the rate of problems for children and adolescents was attributed to "the conditions associated with the onset of puberty or other aspects of maturation" (94).

[20] Physical health concerns were not, however, listed as a possible response in the Minnesota survey item concerning things students "worry about."

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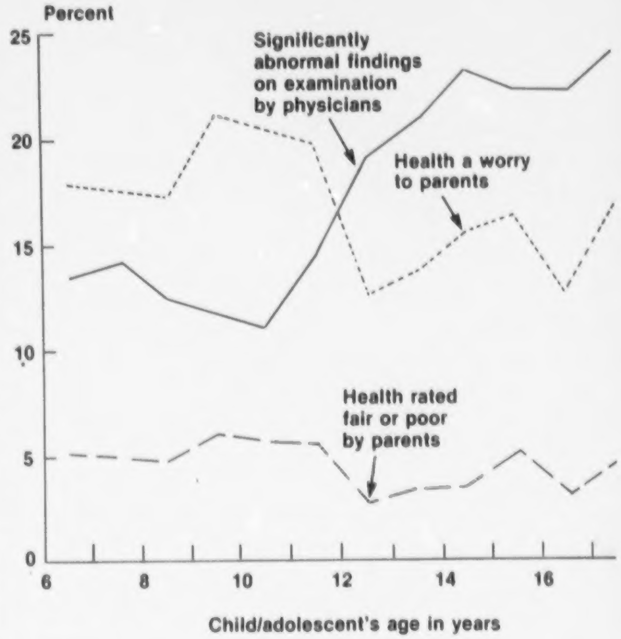
found diverging interests of health care providers and adolescents (see 50, for a review) and suggest that, at least from the adolescents' perspective, adolescents' real concerns are not being attended to by health care providers. In almost all cases, the adolescents who were questioned in this study reported that discussion of issues of interest to them took place considerably less frequently than the adolescents desired (50).[21] For example, while over 80 percent of responding adolescents were interested in discussing physical fitness, nutrition, and growth, discussion of these topics reportedly took place in only 40 to 50 percent of visits. From 60 to 70 percent of adolescents were interested in discussing sexually transmitted diseases, contraception, acne, fear of cancer, and obesity, but these topics were reported to be discussed only 12 to 30 percent of the time. Almost 60 percent of adolescents were interested in discussing feelings of depression and lack of confidence, but such discussion took place only 16 and 11 percent of the time, respectively. Interestingly, the only topic with a close match between adolescents' desire for discussion and how often it actually took place was the topic of menses (of interest to adolescents 55 percent of the time and discussed 49 percent of the time); no specific details of the content of discussions about menses were provided.[22] Dysmenorrhea (painful menstruation) has been identified through surveys of small samples of adolescent girls as a leading cause of pain and absence from school due to physical problems (44,120).

Physical Health Problems From the Perspective of Parents

As discussed above, some surveys (e.g., NHIS and part of NHES) use adolescents' parents as a source of information about the health of their adolescent children. It is important to note that parents may not be a valid source of information on the health of their adolescent children.

No current data are available on this issue, but the 1963-65 and 1966-70 NHES, conducted by the U.S. Department of Health, Education, and Welfare, was able to compare parents' ratings of their children's (including adolescents') health with findings from physicians' physical examinations[23] of the adolescents (94). As shown in figure 6-1, parents' worries about their children's health dropped considerably at about age 13, but there was a large increase in significantly abnormal findings on examination beginning at age 11 through age 17 (the last year of age included in the survey). Parents of 12- to 17-year-olds tended to rate their children's health significantly better than did parents of children ages

Figure 6-1—Parents' Ratings of Child and Adolescent Health Compared to Physicians' Findings on Examination, U.S. Children Ages 6 to 17, 1963-65 and 1966-70[a]



[a] Children ages 6 to 11 were examined from 1963 to 1965 and adolescents 12 to 17 were examined from 1966 to 1970.

SOURCE: U.S. Department of Health, Education, and Welfare, "Examination and Health History Findings Among Children and Youths, 6-17 Years: United States," *Vital and Health Statistics: Data From the National Health Survey*, Series 11, No. 129, DHEW Pub. No. (HRA) 74-1611 (Rockville, MD: November 1973).

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[21] The American health care system's competence to treat the health needs of adolescents is discussed more fully in ch. 15, "Major Issues Pertaining to the Delivery of Primary and Comprehensive Health Services to Adolescents," in Vol. III.

[22] For example, the "discussion" could have consisted merely of a question about whether menses had begun.

[23] As noted above, the physical examination was generally limited to the identification of primarily physical abnormalities, although apparent mental retardation would have been noted.

6 to 11,[24] both when giving a categorical statement of their child's health status and when indicating whether or not aspects of their child's health were a concern or worry.[25] In contrast, survey pediatricians, who actually examined the children and adolescents, rated substantially more adolescents than children as having some significant abnormality. The National Center for Health Statistics could not come to definitive conclusions about the reasons for the reduction in parents' concern but suggested that the reduction probably reflected "a change in attitude or concern." The National Center for Health Statistics was not able to tell if this change occurred because of increased maturity of the child, because more of the abnormal conditions were under care, or because of some other factor.

Unfortunately, children and adolescents themselves were not asked to report on their overall health status or specific health concerns in a survey comparable with that given to parents.

Background on Chronic Physical Illnesses and Disabilities of Adolescents

Trends in the incidence and prevalence of chronic illness and disability among adolescents are reviewed below. Also discussed are consequences common to many chronic illnesses, with a focus on psychosocial consequences. Two other chronic physical health problems of importance to adolescents themselves—acne and dysmenorrhea—are also reviewed in this section.

Trends in the Incidence and Prevalence of Chronic Physical Illnesses and Disabilities Among Adolescents

A small but significant number of U.S. adolescents are believed to experience very serious chronic physical conditions such as severe asthma, juvenile-onset diabetes, congenital heart disease, leukemia, cystic fibrosis, and chronic kidney diseases (70). Unfortunately, however, it is difficult to determine the incidence and prevalence of such illnesses among adolescents. Most studies of chronic illness among children do not report information separately for adolescents. Furthermore, many serious chronic illnesses are not of sufficient prevalence in adolescents to reliably measure in national epidemiological and health services utilization surveys that sample only a small number of adolescents (e.g., NHIS, NAMCS, NHDS, and NHANES). Estimates of the prevalence of serious chronic disorders among all children under age 20 range from 10 to 20 percent (27,72,80) (see box 6-C).

In 1984, using published prevalence estimates for 21 types of chronic conditions, Gortmaker and Sappenfield estimated the prevalence of chronic conditions in U.S. children under the age of 20 (see table 6-9). In aggregate (assuming that each child had no more than one of the specified problems), Gortmaker and Sappenfield estimated that 13.3 percent of U.S. children ages 0 to 20 had a chronic physical or mental condition. If one excludes some chronic mental disorders (i.e., mental retardation, Down's syndrome, and autism),[26] the figure for the remaining chronic conditions drops to 10.6 percent of U.S. children ages 0 to 20. If one assumes that 90 percent of children experiencing these 18 chronic conditions survive to age 20 (as Gortmaker and Sappenfield estimate) and thus experience a chronic condition during adolescence, the prevalence of these 18 remaining chronic conditions among adolescents would be 9.5 percent. Not all of these 18 conditions result in major activity limitations. If one excludes the chronic physical conditions that do not result in a major activity limitation (i.e., mild asthma, nonsevere congenital heart disease, mild and moderate hearing impairments, and mild visual impairments), one could estimate that 4 to 5 percent of U.S. adolescents have chronic physical conditions that make them either unable to carry on a major activity (e.g., attending school) or limited in the amount or kind of major activity. It is important to note that this prevalence estimate by OTA does *not* include chronic mental disorders.

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[24] OTA refers to 10- and 11-year-olds as adolescents, but the National Center for Health Statistics reports on NHES referred to 6- to 11-year-olds as children and 12- to 17-year-olds as "youths" or, less frequently, "adolescents." When comparisons by age were made in the narrative, the National Center for Health Statistics typically aggregated data for these two age groups. However, detailed tables also provided results by each year of age from 6 through 17 (94).

[25] Differences between reports of abnormalities in the medical history (taken from parents) and findings on examination were also reported. Large differences were found for hearing trouble, walking trouble, arm or leg limitations, with more findings on examination than reports of abnormality. (It is important to note, however, that reports of *any* abnormality in the medical history were compared with *specific* abnormalities on examination (94).)

[26] As noted at the beginning of this chapter, some chronic mental disorders have a physical basis.

Box 6-C—Trends in the Prevalence of Chronic Physical Conditions Among U.S. Adolescents

During the 1960s, an estimated 4 percent of U.S. children's visits to primary care practices were for chronic health problems (27). By 1980, some 13 percent of visits to pediatric practices by children under the age of 15 and 18 percent of their visits to all physicians were for chronic problems, both routine and flareup. The increase in proportion of primary care visits by children for chronic conditions reflects a decrease in the incidence of acute illnesses (e.g., infectious diseases[1]) and in the proportion of children with chronic conditions who survive through adolescence (27).

Over the last several decades, technological and medical advances have greatly increased the survivability into adolescence of children with certain chronic illnesses. For example, chances of survival to age 21 for children with cystic fibrosis increased from an estimated 5 percent between 1945 and 1959 to an estimated 70 percent during the 1970s (25). Less dramatic, but significant, improvements in the survivability of children with acute lymphocytic leukemia, sickle-cell anemia, congenital heart disease, and chronic kidney diseases have also been noted (25).

According to data from the National Health Interview Survey (NHIS), the prevalence of chronic conditions that limit activity more than doubled between 1960 and 1981 among U.S. children under 17 years of age (63). There is some disagreement about whether these prevalence changes are real or due to changes in questionnaire design, parent and physician perceptions, and other factors (63). Thus, the degree to which the prevalence of chronic conditions has actually increased among children is somewhat unclear (64).

Gortmaker suggests that dramatic increases in the absolute *numbers* of children and adolescents with chronic illnesses should not be expected during the coming decades for several reasons (25,26). First, there is little room for improvement in levels of survivability, given current rates of greater than 90 percent survival to age 20. Second, even if higher levels of survivability are achieved, smaller birth cohorts since the post World War II "baby boom" have resulted in lower absolute numbers of children with chronic illnesses, thus tending to offset any increases. The only substantial evidence for increases in the incidence of chronic physical conditions in children is the evidence of an increasing number of infants infected with human immunodeficiency virus (HIV).[2] There is also increasing concern about the disabling long-term effects of crack cocaine use during pregnancy on children.

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[1] Unlike the incidence of some infectious diseases, the incidence of sexually transmitted diseases has increased. For further discussion, see ch. 9, "AIDS and Other Sexually Transmitted Diseases: Prevention and Services," in this volume.

[2] Current problems associated with HIV infection among adolescents are discussed in ch. 9.

As noted earlier, data from the 1988 NHIS suggest that 6.8 percent of noninstitutionalized U.S. adolescents ages 10 to 18 are limited in a major or other activity by a chronic physical or mental condition: 4.8 percent are limited in or are unable to perform a major activity (e.g., attending school), and 1.9 percent are limited in an activity other than major activity as the result of a chronic condition (see table 6-8). Although OTA's estimate (based on Gortmaker and Sappenfield's work) that between 4 and 5 percent of U.S. adolescents have a chronic physical condition that limits major activity is similar to the NHIS estimate (4.8 percent), it is important to emphasize that the NHIS estimate *includes* mental disorders, while the OTA estimate does not. If mental disorders were included in the OTA estimate, it would be higher. Another difference between the OTA and NHIS estimates is that the OTA estimate (based on Gortmaker and Sappenfield's work) includes at least some institutionalized populations, while the NHIS estimate does not. Individuals who are institutionalized are probably more likely to have seriously disabling chronic conditions than individuals who are not institutionalized.

Differences in estimates of the prevalence among adolescents of chronic conditions that significantly limit their ability to perform a major activity of daily living) are difficult to resolve. As Gortmaker and Sappenfield noted in their review, "Widely varying estimates concerning the population prevalence of chronic childhood disorders exist, depending upon the definitions used, the methods of study, and the population under investigation" (27).

Consequences of Serious Chronic Conditions for Adolescents

There are significant differences in the physical (and thus the emotional and social) consequences of specific types of chronic physical conditions. Still, the experiences of adolescents with various types of

Table 6-9—Estimated Prevalence of Serious Chronic Conditions in U.S. Children Ages 0 to 20, 1980

Disorder[a]	Prevalence estimates/1,000	Range of prevalence estimates/1,000
Arthritis	2.2	1.0-3.0
Asthma	38.0	20.0-53.0
Moderate to severe	10.0	8.0-15.0
Autism	0.44	0.40-0.48
Central nervous system injury		
Traumatic brain injury	0.05	—
Paralysis	2.1	2.0-2.3
Cerebral palsy	2.5	1.4-5.1
Chronic renal failure	0.080	—
Terminal	0.010	—
Nonterminal	0.070	—
Cleft lip/palate*	1.5	1.3-2.0
Congenital heart disease	7.0	2.0-7.0
Severe congenital heart disease*	0.50	—
Cystic fibrosis*	0.20	—
Diabetes mellitus	1.8	1.2-2.0
Down's syndrome*	1.1	—
Hearing impairment	16.0	—
Deaf	0.1	0.06-1.5
Hemophilia*	1.5	—
Leukemia		
Acute lymphocytic leukemia*	0.11	—
Mental retardation	25.0	20.0-30.0
Muscular dystrophy*	0.06	—
Neural tube defect*	0.45	—
Spina bifida*	0.40	—
Encephalocele*	0.05	—
Phenylketonuria*	0.10	—
Sickle-cell disease*	0.46	—
Sickle-cell anemia*	0.28	—
Seizure disorder	3.5	2.6-4.6
Visual impairment	30.0	20.0-35.0
Impaired visual acuity	20.0	—
Blind	0.6	0.5-1.0

[a] Entries marked with an asterisk (*) designate estimates that were made using specific prevalence at birth and survival data, as well as incidence and duration data, which are described in detail in the original study.

SOURCE: S.L. Gortmaker and W. Sappenfield, "Chronic Childhood Disorders: Prevalence and Impact," *Pediatric Clinics of North America* 31(1):3-18, 1984, reprinted by permission.

serious chronic conditions show at least some similarities (72).

As discussed below, adolescents with such conditions may experience consequences ranging from lost school days to limitations in major activity. They also may experience psychosocial consequences. The families of adolescents with such conditions (and society) may have to bear substantial financial costs (see the section of this chapter on services and interventions for the treatment of chronic physical illness).

Activity Limitations

As noted earlier, the 1988 NHIS found that 6.8 percent of noninstitutionalized U.S. adolescents ages 10 to 18 have limitations of activity due to chronic physical or mental conditions (see table 6-8). About 0.6 percent of noninstitutionalized U.S. adolescents (or about 1 in every 200) are unable to carry on their major activity (i.e., attending school or working) because of a chronic condition; an additional 4.3 percent are limited in the amount or kind of major activity; and an additional 1.9 percent are limited in an activity other than major activity.

The 1988 NHIS also found that noninstitutionalized U.S. adolescents experienced an average of 8.7 restricted-activity days due to acute and chronic conditions per person (see table 6-10). Newacheck's analysis of 1984 NHIS data found that adolescents with a reported limitation of activity due to chronic illness experienced more restricted-activity and bed-disability days than other adolescents (62). In the Newacheck study, adolescents reporting some limitation of activity due to a chronic condition

Table 6-10—Number of Restricted-Activity Days Due to Acute/Chronic Conditions Among Noninstitutionalized U.S. Adolescents Ages 10 to 18, by Type of Restricted-Activity Day and Sociodemographic Characteristics, 1988[a]

	Number of days per person in year			Number of days in thousands		
Characteristic	All restricted-activity days[a]	Bed-disability days[b]	Work- or school-loss days[c]	All restricted-activity days[a]	Bed-disability days[b]	Work- or school-loss days[c]
All persons ages 10 to 18	8.7	4.1	4.7	269,439	127,082	137,604
Age						
10 to 14 years	8.2	3.9	4.5	135,717	64,077	75,286
15 to 18 years	9.3	4.4	5.0	133,722	63,005	62,520
Sex and age						
Male						
All ages (10 to 18)	8.0	3.4	4.5	125,674	52,952	66,710
10 to 14 years	8.3	3.5	4.6	70,051	30,121	39,469
15 to 18 years	7.6	3.1	4.3	55,624	22,631	27,241
Females						
All ages (10 to 18)	9.5	4.9	5.0	143,764	74,130	71,096
10 to 14 years	8.1	4.2	4.4	65,666	33,956	35,816
15 to 18 years	11.0	5.6	5.7	78,098	40,174	35,280
Race and age						
White						
All ages (10 to 18)	9.3	4.4	4.9	233,185	109,763	116,810
10 to 14 years	9.9	4.2	4.8	119,105	56,355	64,751
15 to 18 years	9.8	4.6	5.0	114,080	53,408	52,059
Black						
All ages (10 to 18)	6.6	3.3	4.0	31,844	15,654	17,657
10 to 14 years	5.8	2.7	3.6	15,036	7,061	9,340
15 to 18 years	7.6	3.9	4.5	16,808	8,592	8,317
Family income and age						
Less than $10,000						
All ages (10 to 18)	11.8	5.8	6.7	43,548	21,182	20,890
10 to 14 years	11.4	5.7	6.9	20,591	10,348	12,471
15 to 18 years	12.3	5.8	6.5	22,957	10,835	8,419
$10,000-$19,999						
All ages (10 to 18)	9.1	4.2	5.0	44,637	20,443	23,170
10 to 14 years	8.1	3.8	4.5	21,364	9,951	11,978
15 to 18 years	10.4	4.7	5.7	23,273	10,491	11,192
$20,000-$34,999						
All ages (10 to 18)	8.4	4.0	4.8	62,974	29,999	34,933
10 to 14 years	8.6	3.9	4.5	36,231	16,308	19,103
15 to 18 years	8.2	4.2	5.3	26,743	13,681	15,831
$35,000 or more						
All ages (10 to 18)	8.0	3.9	4.1	84,720	41,411	42,116
10 to 14 years	7.5	3.8	4.2	42,540	21,805	23,891
15 to 18 years	8.6	4.0	4.1	42,180	19,603	18,539
Geographic region						
Northeast	6.7	3.2	4.1	37,896	18,141	21,891
Mideast	9.1	4.1	4.9	72,918	32,805	37,156
South	7.8	3.7	3.9	84,267	40,180	39,935
West	11.4	5.5	6.3	74,358	35,935	38,825
Place of residence						
Metropolitan statistical area	8.7	4.1	4.7	204,409	96,945	104,397
Central city	8.0	3.9	4.4	72,344	35,332	36,799
Not central city	9.1	4.2	4.9	132,065	61,613	67,597
Not metropolitan statistical area	8.7	4.0	4.8	65,030	30,136	33,409

[a] For the purposes of the National Health Interview Survey (NHIS), a *restricted-activity day* is any day on which a person restricts his or her usual activities for more than one half day because of an illness or an injury. Restricted-activity days are unduplicated counts of bed-disability days, work-loss days, school-loss days, and cut-down days.

[b] A *bed-disability day* is defined by NHIS as any day on which a person stays in bed for more than half the daylight hours (or normal waking hours) because of an illness or an injury.

[c] A *school-loss day* is defined by NHIS as any day on which a child did not attend school for at least half of his or her normal school day because of a specific illness or injury. School-loss days are determined only for children 5 to 17 years of age. A *work-loss day* is defined by NHIS as any day on which an individual did not work at his or her job or business for at least half of his or her normal workday because of a specific illness or injury. The number of work-loss days is determined only for currently employed persons.

SOURCE: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Center for Health Statistics, unpublished 1988 data from the National Health Interview Survey, Hyattsville, MD, 1990.

experienced an average of 27 restricted-activity days per year, while other adolescents experienced 7.7 restricted-activity days per year. Adolescents reporting some limitation of activity due to a chronic condition also experienced significantly more bed-disability days than other adolescents: 12.2 bed-days v. 3.7 bed-days (62).

Newacheck found that male adolescents in the 1984 NHIS were more likely to be reported as having a limitation of activity due to a chronic condition than females (7.2 percent of males v. 5.2 percent of females). Younger adolescents were more likely to be reported as having a limitation of activity due to a chronic condition than older adolescents (6.6 percent of 10- to 14-year-olds v. 5.7 percent of 15- to 18-year-olds). Newacheck also found that poor adolescents were 46 percent more likely to be reported as having limitations of activity due to a chronic condition than adolescents living in families with incomes above the poverty line (62).

Not surprisingly, several studies have found that children with chronic conditions miss more school days than healthy children (44). One study found that among children ages 6 to 17, those with chronic mental or physical conditions (e.g., mental retardation, cerebral palsy, or asthma) missed 8.7 days of school, while other children missed 5.8 days of school (117). Another study revealed that students with allergies in nursery school through 12th grade (15 percent of whom were in grades 8 through 12) experienced significantly more absences than nonallergic children (data on magnitude of differences were not presented) (53). Also, one study reported that asthmatic children ages 4 to 16 (one-third of whom were age 12 or older) had an absence rate approximately 24 percent higher than other children (19).

Psychosocial Consequences

McAnarney suggests that social experiences for adolescents with physical disabilities may differ from those of other adolescents in three ways: 1) their exclusion from school activities because of their high levels of school absence, 2) their inability to keep up with their peers physically and their exclusion from some activities because they feel different or ill, and 3) their lack of opportunity for normal peer interactions, both in and out of school (52).

Only a few studies have examined the associations between chronic illness or disability and psychosocial outcomes for adolescents. Most of these studies suffer from various methodological limitations, including small sample sizes and lack of appropriate control groups (9). In addition, most studies are cross-sectional rather than longitudinal, making it difficult to draw conclusions about causality or about the process of adjustment through the course of an illness or disability. Despite these methodological limitations, existing studies do provide some useful information on young people with disabilities.

In the aggregate, adolescents with physical disabilities appear to be more like than unlike their able-bodied peers with respect to their social maturation (52), but the evidence is not consistent. For example, studies of large cohorts comparing adolescents with and without physical disabilities have generally found that these groups do not differ significantly in their levels of self-esteem. Other studies using samples of adolescents with the same types of disability have frequently found that disabled adolescents have lower levels of self-esteem than nondisabled adolescents (52). Still other research, such as a study of survivors of childhood cancer, have found that adolescents with chronic illness actually score higher on measures of self-concept than do normative samples (21).

A recent study found higher levels of emotional and behavioral problems among adolescents ages 12 to 17 with serious chronic physical conditions than among adolescents without such problems (28). Adolescents with serious chronic physical conditions in this study were particularly likely to be reported by their parents to be depressed and socially withdrawn. Although flawed in some ways,[27] this study is impressive in that it was able to disaggregate the effects of socioeconomic status from the effects of having a chronic physical disorder, demonstrating that both have independent effects.

An interview survey comparing matched samples of adolescents with diabetes (n = 31, mean age = 14.7 years) or cystic fibrosis (n = 31, mean age = 14.5 years) with healthy adolescents (n = 31, mean age = 14.5 years) found no statistically significant differences among the three groups on how often they used various strategies to cope with their social and emotional problems, their perceived degree of social support, their feelings of social competency, their perception of control over their life, or feelings of depression (9). However, results indicated that the adolescents with chronic illness were more concerned about their parents' reaction to their health than healthy adolescents were; believed that their parents experienced more stress because of their illness; and were more concerned about their future health (9). The survey found some differences between the adolescents with diabetes and those with cystic fibrosis; adolescents with cystic fibrosis rated their health worse than did adolescents with diabetes or healthy adolescents.

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[27] A possible flaw not pointed out in the study is that the assessment of problems relied entirely on a child behavior checklist filled out by parents; children and adolescents themselves were not surveyed.

In a study examining depressive symptoms over time in a sample of 17 adolescents ages 13 to 19 with cancer, the mean level of depressive symptoms for adolescent cancer patients did not differ from a general population sample of adolescents (41). As in the general population of adolescents, depressive symptoms for the adolescents with cancer were associated with psychosocial events, such as arguing with parents, breaking up with a girlfriend or boyfriend, or being dissatisfied with one's appearance. Similarly, another study found that depression was uncommon among adolescent survivors of childhood cancer (21). (Other consequences associated with cancer during adolescence are discussed in the following section.)

Normal tasks of adolescence may be particularly difficult for adolescents with serious chronic physical conditions (52). Many of the concerns of adolescents with disabilities are the same concerns experienced by all adolescents, but the concerns may be exacerbated by a disability (52). Adolescents with some disabilities may experience more difficulty in achieving separation and independence from their parents than other adolescents, for example, if they rely heavily on their families for financial and personal assistance. And, although adolescents with disabilities have the same concerns about their sexuality as other adolescents, adolescents with some disabilities may have limited chances to develop their sexuality as a result of constraints that include the lack of knowledge about or denial of their sexuality by their parents and the adolescents themselves (52). Lack of socialization with able-bodied peers, either because of limited contact or because of negative attitudes among peers towards developing romantic attachments with someone with a disability, also limits opportunities for some adolescents with disabilities to explore their sexuality.

Independence for people with disabilities requires access to the same opportunities afforded to people without disabilities and sufficient capacity to take advantage of those opportunities (87). Thus, independence may require access to a full range of residential alternatives, accessible transportation, and participation in the political process and may also require family support and assistance; personal-care assistance in the activities of daily living; social support from friends, neighbors, and communities; and the application of technology, such as computers. Some adolescents with disabilities need training to improve their capacities to make life choices, such as through life planning, instruction in problem solving, participation in the development of their individualized education program,[28] and participation in self-advocacy groups (87). The ability of disabled adolescents to achieve independence depends on the severity of their condition, the ability of their family to cope financially and psychologically with that condition, and their personal motivation to become independent (52).

Prevention of Chronic Physical Illnesses and Disabilities Among Adolescents

Many of the chronic physical illnesses and disabilities that U.S. adolescents experience (except those due to injuries) are not really preventable during adolescence. Some of the illnesses (e.g., cystic fibrosis, heart disease, spina bifida, sickle-cell disease) are congenital conditions that cannot be prevented during adolescence. Other chronic illnesses may develop during adolescence, but for many of them (e.g., cancer, arthritis, diabetes, renal failure), not enough is known to establish protocols for prevention for adolescents. Until effective means of primary prevention[29] are developed, the emphasis for many chronic illnesses that adolescents experience must be on early intervention[30] and other forms of treatment. Clearly, however, efforts can be made to prevent adolescents' disabilities from becoming handicaps (see OTA definition of handicap in box 6-A).

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[28] An individualized educational program for each "handicapped" child is required under the Education for All Handicapped Children Act (Public Law 94-142), which was passed in 1975 (92). The program must include a statement of the child's present levels of educational performance; annu goals, including short-term instructional objectives; and other things specified in the regulations implementing Public Law 94-142.

It is important to note that health-compromising behaviors initiated in adolescence may lead to the development of chronic illness among adults. For example, smoking may lead to the development of lung cancer, engaging in unprotected sexual activity may lead to the development of acquired immune deficiency syndrome (AIDS) and other sexually transmitted diseases, and eating high fat diets may lead to an increased risk of heart disease. Attention to the prevention of these and other health-compromising behaviors during adolescence may be warranted.[31]

Services and Interventions for Adolescents With Chronic Physical Illnesses and Disabilities

Use of Health Services by Adolescents With Chronic Conditions

Adolescents with chronic conditions have more contact with the health care system than do other adolescents. According to 1984 NHIS data, adolescents with a chronic condition (mental disorders included) have more physician contacts annually than other adolescents (8.8 physician contacts v. 2.7 physician contacts) (62). They are also more likely to experience a hospitalization (0.181 hospitalizations per year v. 0.038 hospitalizations per year). Furthermore, when adolescents with a chronic condition are hospitalized, they spend nearly twice as long in the hospital as adolescents without such conditions (9.1 v. 4.8 days on average) (62).

A survey of 456 children ages 3 to 18 (no further age distribution was provided) with chronic physical conditions (i.e., cystic fibrosis, cerebral palsy, myelodysplasia, or multiple physical handicaps) found that these children were far more likely than a randomly selected comparison group of children from the same region to be hospitalized during the year (34 percent were hospitalized v. 6 percent of controls) and to have more lengthy periods of hospitalization (11.0 days v. 3.7 days for controls) (81). A relatively small subset of children in the study accounted for the majority of health care use; 75 percent of all outpatient use was accounted for by 25 percent of the sample, and all hospital care was accounted for by 33 percent of the sample.

Similar results were reported from an analysis of 1980 data from the National Medical Care Utilization and Expenditure Survey (NMCUES) by Newacheck and McManus (65). Children and adolescents with activity limitations due to chronic conditions (mental disorders included) were twice as likely to be hospitalized, made twice the number of visits to physicians, and saw nonphysician health care professionals (e.g., physical therapists, social workers) five times more frequently than children and adolescents without activity limitations due to chronic conditions.

Costs of Treatment for Adolescents With Chronic Conditions

Little is known about the total costs of medical services for chronically ill children in the United States (66). There is no single source of information on the full range of costs of care for people with chronic conditions, including adolescents. Total expenditures include personal expenses; expenditures reimbursed by insurance companies; services provided by private organizations; and costs of various

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[29] The traditional taxonomy of prevention distinguishes among primary, secondary, and tertiary prevention (see, e.g., 93a). *Primary prevention* refers to activities designed to avoid disease or other conditions that adversely affect health. Immunizations are one example of primary prevention, but regulatory activities to protect health (health protection) are also forms of primary prevention. *Secondary prevention* includes efforts to identify existing conditions that could cause illness and disability before the appearance of clinical symptoms, or to minimize the progression of disease. Screening for the existence of disease is one form of secondary prevention. *Tertiary prevention* refers to efforts to control irreversible chronic conditions in order to avoid disability or death. Some have suggested that this typology does not adequately distinguish among preventive services (see 93a). Another way to characterize preventive services is by the target of an intervention (e.g., the environment, the individual) and the intended beneficiary (usually individuals).

[30] As described above, *secondary* and *tertiary* prevention (but especially *tertiary* prevention) can include treatment. In this Report, the term *early intervention* is also used for treatment services delivered before a problem becomes serious and/or chronic.

[31] Prevention of smoking is covered in this volume in ch. 12, ''Tobacco, Alcohol, and Drug Abuse: Prevention and Services''; prevention of AIDS is discussed in ch. 9, ''AIDS and Other Sexually Transmitted Diseases: Prevention and Services''; and nutrition and fitness problems among adolescents are covered in ch. 7, ''Nutrition and Fitness Problems: Prevention and Services.''

Federal programs, such as Medicaid, that provide coverage for health care of people with disabilities.

One study that defined disability as having a reported long-term limitation in usual activities (e.g., school) estimated that U.S. children and adolescents with disabilities accounted for a relatively small proportion—$3.9 billion in 1986 dollars (10.9 percent)—out of a total of $35.7 billion in charges for health services provided to persons under the age of 21 (65).[32] [33] [34] In this study, the four leading reported causes of disability for individuals under age 21 were mental and nervous system disorders (prevalence of 7.3 cases per 1,000), followed by respiratory diseases (6.0 cases per 1,000), musculoskeletal and connective tissue diseases (4.3 cases per 1,000), and eye and ear diseases and disorders (3.7 cases per 1,000).[35]

Other evidence suggests that children and adolescents with chronic physical conditions have significantly higher health care costs than other children. For example, one report estimated that a sample of chronically ill and disabled children ages 3 to 18 with cystic fibrosis, cerebral palsy, myelodysplasia, or multiple physical impairments averaged 10 times the yearly expenditures for health care of a general population comparison group of children (81). Half of this difference was accounted for by the greater amount of hospitalization experienced by the children with chronic physical illness and disability.

The costs of care for children and adolescents with chronic conditions are not evenly distributed across this population. In a ranking of children and adolescents under age 21 who were reported to have activity limitations due to chronic conditions in the 1980 NMCUES according to their total health charges, the 10 percent who experienced the greatest health care expenses accounted for 65 percent of all charges accumulated by the children and adolescents with activity limitations (65). Those who experienced the highest total health care costs were most likely to be between ages 16 and 20.

An estimated 14 percent of adolescents with chronic conditions do not have health insurance—about the same percentage as for adolescents without chronic conditions (62,93).[36] Because adolescents with chronic conditions often have high health care expenses, it is critical that they have health insurance. In addition to needing basic coverage provided by most health insurance policies, many adolescents with chronic conditions need more extensive coverage, such as for mental health services, prescription drug coverage, and long-term care benefits.[37] Even those who do have adequate health insurance coverage may incur significant related expenses that are not covered (e.g., travel to health care centers) (61). Thus, families shoulder a significant burden of costs of care for chronically ill children of all ages (7,37), although the extent of the family role is often not considered by policymakers (37). Moreover, excessive burdens to the family may be a factor in a family's decision to institutionalize a chronically ill child rather than attempt to care for the child at home.

Few studies have assessed the actual economic impact of caregiver costs on families with a seriously chronically ill or disabled child. Available studies use different methods and categories of costs and focus on children of different ages with different types of disabilities (sometimes including mental illness and mental retardation). Consequently, it is difficult to generalize the results to all children with chronic physical illness or disability, particularly adolescents, or to assess the overall economic burden to these families. Nonetheless, it is clear that substantial family costs are associated with the care of chronically ill or disabled children (37).

Analyses of the health care costs borne by families of chronically ill or disabled children in

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[32] Data were collected as part of the 1980 NMCUES. Figures were adjusted up to 1986 levels using the medical care component of the Consumer Price Index (65).

[33] The population considered in this study is a subset of the population with chronic conditions, which also includes people who have chronic conditions but who do not suffer activity limitations.

[34] In 1980, individuals under 21 constituted 34 percent of the U.S. resident population (93b).

[35] These four categories accounted for just over half of reported disabilities in the survey. Note that individuals with disability as a result of mental and nervous system disorders, which include mental retardation and neurotic and personality disorders, are included in these analyses. It is not possible, however, to determine from the data presented (65) what the impact of these disorders is relative to other causes of disability.

[36] These analyses included adolescents with chronic mental, as well as physical, disorders.

[37] See ch. 16, "Financial Access to Health Services," in Vol. III for further information on adolescents' health insurance status and health insurance benefits.

general (or by society) have been scarce (65). Newacheck and McManus' analysis, based on data from the 1980 NMCUES, suggested that only a small fraction of families incur "catastrophic" costs, but that analysis was limited by NMCUES' small sample size (65). Of the 6,245 persons younger than age 21 in the sample, only 249 were reported to be limited in their activities. According to Newacheck and McManus, the small sample implies that few children with low prevalence, very serious and costly, chronic conditions will be represented in the sample. In addition, the NMCUES sample excludes the institutional population, and thus excludes a large segment of the most severely ill children and adolescents. Also, the NMCUES data were collected in 1980 and 1981, when children were often hospitalized rather than cared for at home and when health care costs were lower. Finally, NMCUES interviewers were instructed to indicate to survey respondents that limitation of activity refers to a limitation caused by long-term illness or disability *only* when a respondent asked for clarification; in some cases, therefore, a limitation reported in the NMCUES may have been caused by an acute, rather than a chronic, condition. Although Newacheck and McManus suggest that the number of such cases should be small (and that other features of the NMCUES questions could compensate for the ambiguity about chronicity), the small overall number with reported limitations in activity still invites cause for concern. Thus, a particular finding from Newacheck and McManus' analysis should be viewed very cautiously—namely, the finding that families of all children with limitations in activity averaged $135 in 1980 dollars per child in out-of-pocket expenses for health care and that families of the 10 percent of children consuming the greatest amount of care averaged $300, while families with children without activity limitations averaged $76.

A study by Butler et al. examining sources of payment for physician visits by disabled children[38] (about a third of the 1,726 children in the study were ages 11 to 13) found that in families without health insurance, parents paid all of the costs of the visit 70.6 percent of the time (8). In families with private health insurance, parents paid all costs 30.7 percent of the time and partial costs 44.3 percent of the time; in families with public health insurance, parents paid all costs 4.6 percent and partial costs 2.8 percent of the time. Whether children with disabilities had seen a physician in the past year was significantly associated with whether the children were covered by insurance, even after controlling for survey site, race and ethnicity, socioeconomic status, age, and type of disability. Disabled children with health insurance were 1.8 times more likely to have seen a physician than those without insurance.

Jacobs and McDermott's review of three studies of family caregiver costs for chronically ill and disabled children concluded that: 1) estimated *incremental money costs* (i.e., apart from the costs of therapy) to families of children (ages unspecified) with cancer ranged from $1,121 to $4,012, and 2) estimated *annual time costs* (e.g., family members giving up time from work and other activities) ranged from $1,514 to $4,697, for a total range of estimated incremental money costs from $3,000 to $9,000 annually (37). Two studies that met minimal methodological criteria and covered other serious chronic diseases were also subject to review. One of the studies, on cystic fibrosis, found an annual incremental money cost of $334, but the reviewers were unable to estimate the incremental time or money costs to families of a child with spina bifida (37).

In conclusion, current estimates of the financial costs to families of chronic illness and disability among adolescents are highly variable, and more research on this topic is warranted.

Interventions To Treat Psychosocial Problems of Adolescents With Chronic Conditions

In a 1990 review of the association of chronic physical health problems and behavioral or emotional problems, Gortmaker and colleagues concluded that, despite general acceptance of the idea "that children with chronic conditions are at higher risk for developing behavioral problems," the literature contains few accounts of systematic, well-documented attempts to prevent or ameliorate these functional problems" (28).

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[38] This study classified children as disabled on the basis of enrollment in special education classes. The primary disabling condition of about a third of the children in the sample was a neuromuscular, orthopedic, or sensory impairment, or a chronic disease. The remainder of the disabled sample included children with problems such as learning disabilities, attentional deficits, mental retardation, speech impairments, or emotional or behavioral dysfunctions (8).

Photo credit: Katherine Criss, New York, NY

Independence for adolescents with disabilities may require access to the same opportunities in life afforded to people without disabilities.

The Gortmaker review found only five accounts of systematic, well-documented attempts to prevent or ameliorate chronically ill children's psychosocial problems (28). All but one of the studies found beneficial effects, but only two of the programs included or focused on adolescents (28). Two studies with small samples documented the effectiveness of educational programs geared to increase health knowledge and self-care and to improve the functioning of children with asthma (18,46). A randomized controlled trial of a university hospital-based home care program for children with a broad range of long-term health needs demonstrated beneficial effects on the pyschologic functioning of the children (82). Pless and Satterwhite found that a lay family counselor intervention also improved psychosocial functioning of children with chronic physical health problems (73). On the other hand, a randomized controlled trial of a social work intervention conducted by Nolan et al. at Montreal Children's Hospital indicated no effects from a 6-month intervention intended to improve psychosocial functioning for children with chronic physical conditions (68).

The two programs that included or focused on adolescents were the lay family counselor intervention (73) and the social work intervention in Montreal (68). Both of the programs focused on providing assistance to families as a whole (primarily parents), although it was the aim of the programs to improve the psychosocial status of the adolescents. Differences between these two programs may be helpful in evaluating why one failed and the other did not. The program reported by Nolan et al. was a short-term (6-month) intervention in which social workers had minimal (an average of three times) personal contact with some member of the family (68). Half the families did not find the intervention helpful. Although the program reported by Pless and Satterwhite used lay volunteers rather than professionals, these lay volunteers were able to spend much more time with the families (an average of 4.6 hours per month with each of eight families) over the course of a year (73). Pless and Satterwhite found that children's psychological improvement increased with the amount of time spent by the lay counselor (73). In addition, the lay volunteers were chosen on the basis of their personal characteristics and proven success in childrearing, which Pless and Satterwhite asserted might not be possible to do with professional staff (73).

One of the main issues for adolescents with serious chronic physical illnesses or disabilities is the development of greater independence (49), and a number of programs have developed to enhance the capacities of adolescents with serious chronic physical illnesses or disabilities to be independent. Some programs employ interdisciplinary teams to assess and provide services to adolescents with chronic illness or disability. One such program is the Comprehensive Adolescent Medicine program at the Montefiore Medical Center in New York City. The program, originally funded by the Robert Wood Johnson Foundation in 1979, provides chronically ill young people ages 10 to 20 with comprehensive, interdisciplinary care designed to help them develop into independent adults. The program serves between 450 and 500 young people each year (77).

Another program, the Youth in Transition Project at the University of Washington in Seattle, is a demonstration project funded by DHHS' Bureau of Maternal and Child Health. This program is designed to facilitate transitions from high school and home to employment and independent living for individuals ages 17 to 21 with developmental disabilities, cognitive impairments, or chronic physical illness (10). Each participant in the project receives an extensive evaluation from an interdisciplinary team including a physician, nutritionist, psychologist, and a social worker. A transition plan is then developed that might include, depending on the needs of the adolescent, vocational planning, life skills training, sexuality education, and nutrition education and a diet plan. Followup is then provided to determine how clients are progressing in their transition and whether assistance is needed in implementing the transition plan. Preliminary evaluations of the demonstration project based on the first 27 clients indicate that families found the assessment process useful.

Other types of programs focus on experiential learning for adolescents with chronic illness or disability to increase their sense of personal efficacy. Adventure, Inc. is a program that provided an Outward Bound experience, consisting of a 9-day wilderness and a 5-day urban experience, for chronically ill, physically disabled, and able-bodied adolescents (42). After participating in the program, both able-bodied adolescents and adolescents with disabilities or chronic illnesses, showed improved body image, declines in family conflict, and increases in individual recreational activities relative to family recreational involvement. Although the study is limited by a small sample size (n = 37, 23 of whom were chronically ill or disabled), the study does indicate the potential of an Outward Bound type of program for developing independence for adolescents with chronic illness or disability.

Another program, the Adolescent Employment Readiness Center at Children's Hospital National Medical Center in Washington, DC, has provided vocational services, including vocational aptitude and aptitude testing and job placement, to over 100 young people ages 12 to 19 with chronic health problems such as juvenile rheumatoid arthritis, spina bifida, muscular dystrophy, kidney failure, diabetes, epilepsy, and cystic fibrosis (12). The program, which was funded by a grant from the DHHS Bureau of Maternal and Child Health, is designed to improve prevocational readiness and enhance independence. Through the program, adolescents are placed in volunteer or paid jobs ranging from clerical jobs to lifeguarding. An evaluation of this program is under way, but no outcome data are available yet (118).

State and Local Services for Adolescents With Chronic Conditions

Assistance may be available for adolescents with physical or mental disabilities from a variety of State agencies depending on the State (36). These agencies include State departments of education, which provide special education services; offices of State coordinators of vocational education for handicapped students, which coordinate vocational education services; and State mental health departments. Other sources include State mental retardation agencies, programs that have received funding from the DHHS Bureau of Maternal and Child Health for direct medical and related services to children with special health care needs, and State developmental disabilities agencies. State protection and advocacy systems provide services to persons with developmental disabilities, and State vocational rehabilitation agencies provide services needed to prepare persons with disabilities for work. Finally, a number of universities have university-affiliated programs, which provide services and programs for children and adolescents with disabilities and their families. There is considerable variability across States in how these various services are provided, and in where the various functions are housed organizationally.

According to Blum, there are major problems in the care of adolescents with chronic illness and disabilities (5). These include the lack of coordinated care among subspecialist services; provider ignorance of the various health, education, and social services in the community; a lack of attention on the part of health care providers and policymakers to providing for adolescents' transition to the adult health care system; and failure to address the sexual and reproductive needs of adolescents with chronic illnesses and disabilities.

Some observers have noted that services to children with chronic illness are frequently disease specific (72). That is, often specialized services emerge to address the needs of persons with only certain types of disorders. Voluntary and advocacy organizations, which represent only one or a few disorders, rarely coordinate their advocacy efforts.[39] The result is that policies are made or programs are developed that address specific concerns of advocates for specific problems, rather than the generic needs of people with varying types of disabilities. In addition, the needs of children with illnesses without effective advocates may not be addressed in the policy domain.

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[39] There are notable exceptions to this lack of coordination, for example, the Technology-Related Assistance for Individuals With Disabilities Act of 1988 (Public Law 100-407), which was actively backed by a broad coalition of organizations and individuals in the disability community. However, the coordinated effort was to encourage the passage of legislation, not to actually provide services.

Examples of Chronic Physical Illnesses Among Adolescents

OTA has used the available information on the prevalence and importance of chronic physical health problems to identify for further discussion in this chapter one serious problem—cancer—and two problems with less dire consequences—acne and dysmenorrhea. Each of these illnesses illustrates certain important issues about services to treat physical illness in adolescents.

Cancer was chosen because it is the most frequent cause of natural death (i.e., death caused by illness, disease, or chronic conditions as opposed to death caused by external causes such as accidental injuries, suicide, or homicide) among U.S. adolescents. Adolescents with serious chronic illness such as cancer and their families merit public attention for these major reasons:

- significant public funds are consumed by these children, particularly for health care;
- the needs of children with chronic illness are not likely to be met by the existing health care system; and,
- thanks to the advances in technology and health care over the past several decades, significantly greater numbers of children with chronic illness are now surviving into adolescence and adulthood (72).

Cancer is a low prevalence disease that has very serious short- and long-term consequences for adolescent victims and their families.

Acne is a leading cause of adolescents' visits to office-based physicians, and it is identified by adolescents as an important concern. Usually thought of by adults as a minor problem, common acne (acne vulgaris) is experienced by the vast majority of U.S. adolescents.

Dysmenorrhea (painful menstruation) is a problem for many young women, and it contributes significantly to school-loss days among adolescent females (39,44,120). Although identified by adolescents as an important concern, dysmenorrhea may not be adequately addressed by health care providers.

Cancer Among Adolescents

Cancer is the leading cause of *natural death* among U.S. adolescents. For U.S. adolescents ages 10 to 14, malignant neoplasms (cancer) are the *second* leading cause of death, following accidental injuries; for U.S. adolescents ages 15 to 19, malignant neoplasms are the *fourth* leading cause of death, following accidental injuries, suicide, and homicide (103).

While the number of adolescents dying from cancer is small, and cancer treatment represents only a small portion of health care services delivered to adolescents, a number of issues specific to cancer are important to address. Adolescents with cancer, and their families, suffer devastating personal effects as a result of treatment, and the costs to families of cancer treatment are high. Cancer and cancer treatment put adolescents at risk for a number of short-and long-term physical problems, and death.

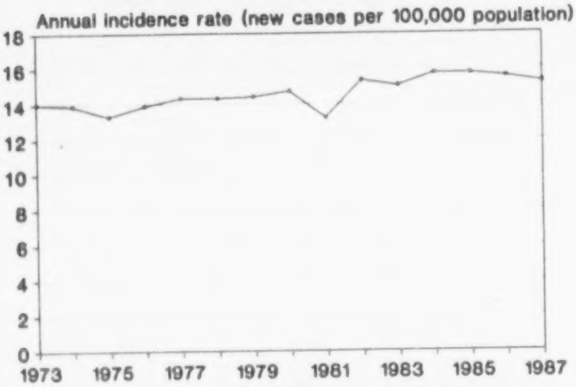
Trends in the Incidence and Prevalence of Cancer Among Adolescents

U.S. adolescents generally have lower cancer rates than Americans in other age groups. However, adolescents ages 10 to 19 experience the highest rate of bone cancer except for those ages 60 and above. And, they experience more acute lymphoblastic leukemia, the most common form of leukemia experienced by adolescents, than all Americans except those ages 9 or younger, or 80 and above (110). In general, the incidence of cancer among U.S. adolescents has remained relatively stable since the early 1970s (see figure 6-2), with the exception of acute lymphoblastic leukemia, which has increased in incidence (110).

Substantial advances in treatment of childhood cancers have led to declining death rates in recent years (see figure 6-3). Between 1960 and 1984, 5-year survival rates among children of all ages increased from 20 to 48 percent for bone cancer, from 52 to 91 percent for Hodgkin's disease, from 33 to 82 percent for Wilm's tumor, from 35 to 55 percent for brain and nervous system cancers, and from 18 to 60 percent for non-Hodgkin's lymphoma (110).

Dramatic increases in survival have also been realized for leukemia among young people. While as recently as 40 years ago nearly all children diagnosed with leukemia died of the disease (83), about half of the white males and females ages 0 to 14 diagnosed with leukemia in 1979 survived 5 to 6

Figure 6-2—Incidence of Cancer Among U.S. Adolescents Ages 10 to 19, 1973-87



SOURCE: Office of Technology Assessment, 1991, based on U.S. Department of Health and Human Services, Public Health Service, National Institutes of Health, National Cancer Institute, unpublished Surveillance, Epidemiology, and End Results Program data, Bethesda, MD, 1989.

years (110).[40] Nevertheless, leukemias, followed by brain and central nervous system cancers, are the most common cause of cancer deaths among U.S. adolescents.

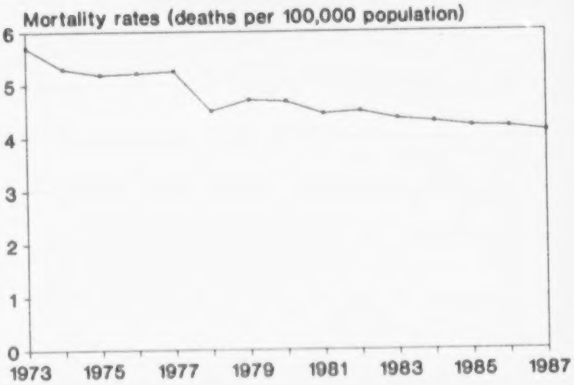
Consequences of Cancer Among Adolescents

Increases in survival among cancer patients mean that more individuals contracting cancer during early childhood will survive into adolescence and that persons with cancer during their adolescence have a high probability of surviving into adulthood. There are a number of significant short- and long-term consequences of cancer for adolescents.

Short-Term Consequences for Adolescents—Short-term consequences of cancer include the side effects of treatments, interruptions in major academic and socializing activities, and the psychological distress that may arise from these more overt consequences.

The side effects of cancer treatments such as radiation and chemotherapy can be devastating for adolescents. In a study involving interviews with 40 survivors of childhood and adolescent Hodgkin's disease (70 percent of whom were ages 12 to 19 at the time of diagnosis), half of the respondents reported that the "worst" thing about having Hodgkin's disease was experiencing the side effects of treatment (115). A study by Wasserman et al. of survivors of childhood/adolescent Hodgkin's disease found that females, in particular, were likely to identify side effects of treatment (especially loss of hair) as the most traumatic part of their illness (115).

Figure 6-3—Cancer Mortality for U.S. Adolescents Ages 10 to 19, 1973-87



SOURCE: Office of Technology Assessment, 1991, based on U.S. Department of Health and Human Services, Public Health Service, National Institutes of Health, National Cancer Institute, unpublished Surveillance, Epidemiology, and End Results Program data, Bethesda, MD, 1989.

Immediate side effects of treatment include nausea and vomiting and pain associated with the administration of the chemotherapy agents. Ulceration of the mouth or gastrointestinal tract are also common side effects, appearing several days after a dose of chemotherapy (57). Radiation and chemotherapy frequently lead to loss of hair (alopecia), necessitating the use of a wig or appearing bald in public (33). These side effects of treatment can be particularly difficult for adolescents because of their heightened concern about their appearance and relationship to their peers.

Individuals receiving treatment for cancer also are particularly susceptible to secondary infections (83). Even after they receive treatment, some individuals experience anxiety about their condition. In a 1988 study, a quarter of the 41 survivors of childhood cancer interviewed were extremely preoccupied with their physical condition (21).

Young people with cancer may find it difficult to keep up with school. The need for frequent treatments, often at a distance from home, may result in high levels of school absence. Many school systems provide good in-home tutoring services, but the quality of services is not consistent across schools (69). Individuals interviewed in Wasserman et al.'s retrospective study of the effects of childhood and adolescent cancer missed an average of 6 months of school while they were undergoing treatment (115). Some may drop out of school after extended absences (115). Even when young people return to school, they may find that they are ostracized by their peers. Forty percent of those interviewed in the study by Wasserman et al. remembered being teased about their appearance or being treated as outcasts (115).

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[40] Data presented are for white children only; data for black children are unreliable because of small sample sizes.

Long-Term Consequences for Adolescents—Long-term side effects of cancer can also be quite serious and include secondary cancers, sterility, and growth retardation (13,57,83,115). Chemotherapy and radiation can also result in gonadal damage, resulting in smaller testes for males (76). The long-term effects of gonadal damage resulting from chemotherapy and irradiation may not become evident until adulthood (e.g., sexual dysfunction, increased risk of heart disease) (76). Females treated for leukemia with chemotherapy and radiation have been found to experience significantly earlier breast development, to have a lower mean age of menarche than average, and to go through puberty in a shorter period of time than average. This early puberty and limited potential for growth can have a number of psychological effects on adolescents. Secondary cancers are also possible sequelae of cancer treatment (57).

Adolescent cancer can also have long-term social or emotional effects. For example, evidence indicates that survivors of childhood cancer often confront employment discrimination and discrimination in obtaining life and health insurance policies (111). For people who do not belong to group health insurance policies (e.g., through an employer), health insurance may be very expensive or even unobtainable (115). Discrimination may occur in other areas as well; Wasserman et al. found that 5 of their 23 male subjects reported being denied entry into the armed forces because of their cancer history (115).

Available evidence suggests that most adolescent survivors of childhood cancer do not experience higher levels of depression or lower levels of self-esteem than other adolescents (29). Survivors with severe long-term medical effects (e.g., physical disfigurement, loss of a limb, gonadal failure, or second malignant neoplasm) tend to experience greater levels of depression and to have a lower self-concept than survivors with no long-term cosmetic or organ dysfunction (29).

Many survivors of childhood cancer actually identify positive effects of their experience with cancer. One study reported that 61 percent of the adolescent survivors of childhood cancer interviewed identified positive effects, such as increasing their self-confidence, enabling them to be more empathetic, increasing their appreciation of life, and making them more mature (21). Likewise, Wasserman et al. found that 95 percent of adult survivors of child or adolescent Hodgkin's disease identified positive consequences (115).

Prevention of Cancer Among Adolescents

Most cancers that occur during adolescence could not have been prevented given the current state of knowledge. Except for the relationship between prenatal radiation of a pregnant mother and childhood leukemia (6,79), little is known regarding the cause of leukemia. The risk of secondary leukemia increases with certain types of cancer chemotherapy (110).

Discussions about preventing cancer in adolescents generally focus on the prevention of future cancers that are linked to engaging in health-compromising behaviors (e.g., 51). These behaviors, which may be initiated or established during adolescence, include smoking, drinking alcohol, using certain contraceptives, eating habits, and tanning.[41] Results of the 1987 National Adolescent Student Health Survey of more than 11,000 8th and 10th graders found that these adolescents had a number of eating practices that may increase their risk of cancer later in life. These include high consumption of fatty foods (59 percent reported eating fried foods one to three times weekly and 39 percent did so more than three times weekly), and a lack of knowledge about some risk factors for cancer (e.g., few were aware of the role of dietary fiber in the prevention of colon cancer) (74).

Other behaviors common among U.S. adolescents, such as tanning, may increase the risk of developing cancer later in life. A survey including 126 adolescents, conducted by the American Academy of Dermatology, found for example, that 67 percent of adolescent females and 33 percent of adolescent males reported intentionally working on a tan and that they did not take precautions from the sun (23). Although similar percentages of adults reported working on a tan, fewer (23 percent) took no precautions to protect themselves from the sun. Seventy-five percent of adolescents (compared to 66 percent of adults) believed tans make people look healthy. Overexposure to the sun, however, can have dangerous outcomes. In a study of melanoma in women, those who reported having five or more blistering sunburns between the ages of 15 and 20 were more than twice as likely to have developed malignant melanoma by ages 38 to 65 (the age group surveyed) as were those who had experienced no such burns (116). This exposure during the adolescent years was found to be a much more important determinant of melanoma incidence than exposure after the age of 30. Preventive efforts should focus on the behaviors of children and adolescents to reduce their intensive sun exposure.

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[41] Adolescents' smoking and alcohol use is discussed in ch. 12, "Alcohol, Tobacco, and Drug Abuse: Prevention and Services," their nutrition and eating habits are discussed in ch. 7, "Nutrition and Fitness Problems: Prevention and Services," and their contraceptive use is discussed in ch. 10, "Pregnancy: Prevention and Services," all in this volume.

There is evidence that many U.S. adolescents do not have accurate knowledge about the etiology, warning signs, prevention, and treatment of cancer. A survey of 870 inner-city junior and senior high school students (mean age = 14) found a significant lack of understanding about cancer (75). Although most (approximately 90 percent) recognized the association between cigarette smoking and cancer, fewer than half recognized the role of nutrition. Of the seven warning signs of cancer recognized by the American Cancer Society (ACS), only the sign of a lump or bump in the breast or elsewhere was identified as a warning sign of cancer by more than half the students.

The study found differences between white and black adolescents in their understanding of cancer. Only 9 percent of the black students and 3 percent of the white students knew that blacks are more likely than whites to get cancer and to die from cancer. In addition, fewer black than white students believed that they could get cancer. Perhaps most critically, the black adolescents were significantly less likely than whites to see the value of early treatment for cancer or to believe that cancer can be cured. Thus, there appears to be a need, particularly for some adolescents who may be at highest risk for developing cancer in the future, to increase knowledge about risk factors, warning signs, and the importance of early detection and treatment.

In 1985, the ACS appointed a National Public Education Subcommittee on Youth Education that developed a "Plan for ACS Youth Education Program" (15). ACS initiated a campaign to increase awareness of childhood and adolescent cancer (83) that includes a book by humorist Erma Bombeck (40) and a "Peanuts" television special (16). ACS also sponsors a variety of public education programs, including programs targeted at elementary, intermediary, and secondary school students. The programs include educational strategies designed to promote good health habits among young people, help them make health-enhancing lifestyle decisions, and help them understand the relationships between health behaviors and cancer risk reduction (2).

Services and Interventions for the Treatment of Adolescent Cancer

Cancers in adolescents are most frequently discovered by primary care physicians (33). Most childhood cancers are detected at early stages, as parents are likely to seek medical care soon after observing a health problem (110). Current methods of treating cancer generally have to be offered in tertiary care facilities that provide sophisticated multidisciplinary care to cancer patients (55). Although much treatment must take place in these cancer centers, however, the primary care physician in the community can still play an important role. He or she can act as a link between the family and the cancer center, administer certain drug treatments (particularly during the maintenance phase), and monitor the adolescent with cancer during followup.

Because cancer centers are often some distance away from the adolescent's home, families frequently incur extensive nonmedical costs when the adolescent is at the treatment center, such as travel and lodging costs and lost wages because of time away from work. It is believed that the use of community-based care, in coordination with treatment at a tertiary center, has the potential to greatly reduce these economic costs to the family (55).

Despite the difficulties inherent in undergoing treatment for cancer, some evidence indicates that adolescents are generally cooperative partners in treatment, although little research exists in this area. One study covering adolescents' compliance with treatment, however, found older adolescents to be less compliant than younger adolescents, suggesting that the transfer of greater responsibility for treatment from parent to adolescent may be associated with greater noncompliance in adolescents struggling to gain autonomy (85). Similarly, in a study with 27 adolescents in remission from cancer (ages 12 to 18), adolescents were rated by nurses as being moderately cooperative with treatment, though older adolescents were rated as being less cooperative than younger adolescents (38). Compliance with orally administered chemotherapy agents may be increased if adolescents and parents agree on who is responsible for administering the medications, although older adolescents may still tend to be less compliant than younger adolescents even when they agree with their parents on medication instructions (85).

There is evidence that while younger children with cancer may be more comfortable with not fully understanding the seriousness of their disease, adolescents appreciate being kept informed throughout their diagnosis and treatment and have a good understanding of their treatment (115). Efforts to improve the quality of life of adolescents with cancer by reducing the negative effects (e.g., loss of hair, nausea, risk of secondary cancers) of treatments are greatly needed. Strategies include developing mechanisms for best identifying leukemia patients at highest risk of relapse so patients at most risk may be targeted for more extensive treatments and patients at least risk will not have to endure longer courses of therapy (13).

Interventions for the Treatment of Adolescent Cancer—Substantial support for basic and clinical cancer research and patient activities comes from private sources such as ACS. ACS has an affiliation agreement with the Candlelighters Childhood Cancer Foundation that links over 250 parent self-help groups for families of children and adolescents with cancer (56). These groups can provide families a diverse range of support including funds for wigs or prostheses, educational information, peer counseling, and a forum for discussion of common concerns.

Supportive services provided by ACS include the provision of home-care items, transportation services, and patient and family education. Of the 1986-87 ACS budget of $306.23 million, 28 percent went to research, 19 percent to public education, 13 percent to patient services, and 10 percent to professional education (2).

Barriers to Treatment for Adolescents With Cancer—A significant barrier to care for adolescents with cancer is the current state of available treatment. Although significant advances have been made in the development of treatments that increase survivability, the treatments themselves may reduce the quality of life to the extent that adolescents and their parents may question their value.

Adolescent medicine specialists, and health care providers who feel competent to work with adolescents, are relatively few in number.[42] Adolescents, however, have a number of special concerns related to their treatment for cancer that need to be addressed. For example, they must adjust to the impact of the illness and treatment on their relationships with their peers, their sexuality, and their developing independence. In addition, adolescents' understanding of the disease and its implications will be more sophisticated than those of young children because they are more advanced developmentally and more capable of abstract reasoning.

Costs of Cancer Treatment for Adolescents—Even for adolescents with health care coverage, the costs of cancer treatment can be staggering. For adolescents in geographically isolated areas, which are likely to be farther from pediatric cancer centers, these problems can be even more burdensome (3,69). Some families may even lose their homes. A witness at a hearing of ACS reported that his 13-year-old daughter was hospitalized 63 times in one year because of an abdominal tumor; the family was eventually evicted for falling behind in their rent because of medical bills (3).

Pendergrass et al. followed for 2 years the total hospital costs for 24 children (no ages specified) diagnosed with leukemia at a Seattle hospital in 1979 (69). They estimated that the first-year therapy costs for children with acute lymphoblastic leukemia averaged $12,334, with a range from $2,000 to $40,825. For the 10 children who completed 2 years of therapy, costs averaged $21,114 for 2 years, with a range from $2,958 to $52,343. Many of these costs were probably covered by insurance. However, these estimates included only treatment costs within the site where participants were identified; they did not include other physician fees or out-of-pocket expenses for the families. Thus, they are conservative estimates of the actual costs of care for these children.

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[42] For further discussion, see ch. 15, "Major Issues Pertaining to the Delivery of Primary and Comprehensive Health Services to Adolescents," in Vol. III.

Data for the study by Pendergrass et al. were collected in 1979 when bone marrow transplants for leukemia were extremely rare. Bone marrow transplants have been a major factor in improving leukemia survival rates. However, for a child with leukemia who requires a bone marrow transplant and does not have access to a compatible donor, the limited information available suggests that costs can go well beyond what insurance will cover. In interviews with four transplant centers for a 1990 staff paper, OTA found that the costs of locating an unrelated donor ranged from $13,810 to $20,475 (113). Information is scarce on the costs of the procedure itself; one transplant center puts the range at $150,000 to $250,000 (67).

In 1989, researchers examined the so-called "incremental" costs to families of caring for children with cancer (no ages were specified) (37). Cost categories in the study included direct home costs, travel costs, durable equipment and other capital costs, and time costs (i.e., family members giving up time from work and other activities) but did *not* include costs of therapy. In analyzing the three studies that provided data on such "incremental" costs, the researchers found that estimated annual money costs ranged from $1,121 to $4,012 across the studies; estimated annual time costs ranged from $1,514 to $4,697. Overall, total incremental costs (including time costs) represented about 28 percent of family incomes.

Major Federal Policies and Programs Pertaining to Cancer Among Adolescents

The National Cancer Institute (NCI) within DHHS provides the major Federal support for research on cancer. Currently funded basic research includes study of the basic biology of normal and malignant hematopoietic cells to learn more about the origin and progression of leukemia, studies of drug metabolism in leukemia patients to learn more about disease and treatment-related changes in these patients, and studies to predict which patients might benefit most from additional therapy (111). NCI is also currently funding a followup study of childhood leukemia survivors through early adulthood to learn more about the effects (especially endocrinologic effects) of the disease and its treatment. Other epidemiologic studies are examining the environmental and genetic risk factors for developing leukemia (both acute lymphocytic leukemia and nonlymphocytic leukemia). Other studies focus on different childhood cancers. One study is assessing the risk of developing leukemia and other cancers after intensive chemotherapy and radiation therapy for Hodgkin's disease. Another is examining exposure to N-nitroso compounds as a risk factor for developing brain tumors during childhood and adolescence. Other studies are examining the effects of various treatment therapies on different cancers (111).

NCI also provides support for programs and research studies that focus on the physical and psychological health of cancer patients (111). These include teen support groups to aid adolescent patients, pain management and stress-reduction programs for young cancer patients, and programs that focus on reducing the psychological side effects of cancer treatments, including a study identifying and monitoring the effects of cancer and treatment on the neuropsychologic development of children with leukemia. Another focus of support for NCI is on interventions that minimize the social and academic difficulties of long-term childhood cancer survivors. One currently funded study is focusing on increasing school attendance of children with newly diagnosed cancer. It is anticipated that the provision of ongoing scholastic and peer involvement will help to counteract the anxiety and depression experienced by severely ill patients. Another main focus of NCI funding is on prevention. This includes support for antismoking efforts and nutrition studies.

Acne Among Adolescents

Acne vulgaris, or common acne, is a disorder of the sebaceous (or oil) glands, sebaceous ducts, and hair follicles that results in skin eruptions. The vast majority of American adolescents experience acne. An estimated 90 percent of adolescent males and 80 percent of adolescent females are affected with acne to some degree (33). Some adolescents experience only a few occasional pimples; others are plagued by persistent pustular acne that lasts for years, leaving disfiguring scars. Each case of acne follows its own individual course. Because acne is so prevalent among adolescents and is not life-threatening, many health care providers, policymakers, and others may minimize its importance to young people.

According to data collected during the 1985 NAMCS sponsored by the National Center for Health Statistics, the majority of U.S. adolescents who visited a dermatologist (60.1 percent) in 1985 did so because of acne (101). The percentage of older adolescents who went to a dermatologist because of acne was higher than the percentage of adolescents ages 10 to 12 who visited a dermatologist because of acne.[43] About two-thirds (66.4 percent) of visits to dermatologists by adolescents ages 16 to 18 were for acne (101). Only 1.2 percent of visits by 16- to 18-year-olds to general practice or family physicians were for acne, however for older adolescent males, acne was the most frequent reason for visiting a physician. Limitations in available data make comparisons by race impossible for specific conditions.

Myths about acne abound. These include beliefs that acne is caused by the consumption of certain foods (such as chocolate), by sexual activity or thoughts, or by poor hygiene. Actually, several factors are involved in the development of acne. Rising levels of certain hormones during adolescence increase the activity of oil glands. Heredity also plays a role; adolescents are more likely to develop acne if they inherit oily skin that is sensitive to the effects of hormones. Plugged oil glands are also a factor; oil glands can become plugged when cells lining the oil glands or pores shed and stick together. Finally, skin bacteria are a factor; plugged pores can become infected when bacteria are present, leading to the development of pustules or cysts (1,33).

An estimated $120 million is spent each year on acne treatment, including $100 million on over-the-counter acne medications (114). What portion of this is spent by or on the behalf of adolescents is unknown, but it is likely to be considerable given the high prevalence of acne among adolescents.

There is no cure for acne. The goal of treatment is generally to control the condition and prevent or limit scarring (33). A variety of treatments are available (30,33,84). A topical 5- to 10-percent benzoyl peroxide solution is a commonly used drying and peeling agent. It is available over-the-counter as a lotion, or by prescription as a gel. Another topical product used for more severe acne is tretinoin, which is available only by prescription. Antibiotics are also frequently part of the treatment regimen for severe acne. Oral antibiotics (e.g., tetracycline or erythromycin) or topical antibiotics (e.g., erythromycin or clindamycin) may be used. Isotretinoin (13-cis-retinoic acid) is a relatively new treatment for severe cystic acne.

Each of these treatments has negative side effects (33,84). Benzoyl peroxide and tretinoin produce drying and peeling. About 2 to 3 percent of people may be allergic to benzoyl peroxide. Tretinoin can also be very irritating to the skin, sometimes resulting in exacerbation of acne during the initial stages of treatment. Sun exposure increases skin irritation for adolescents using tretinoin, necessitating either avoidance to sun exposure or use of a sunscreen. Oral antibiotics can irritate the stomach and, in young women, increase the chances of developing vaginal yeast infections. Topical antibiotics may cause a yellowish discoloration of the skin. Isotretinoin, which should be used for only the most severe cases of acne, can produce birth defects if used during pregnancy and should not be used for anyone who is pregnant or who is likely to become pregnant. Other side effects of isotretinoin include cracking and scaling of the lips (90 percent of users), severe drying of the skin (80 percent of users), and conjunctivitis (inflammation of the mucous membrane that lines the inner surface of the eyelids and the forepart of the eye) and difficulty with contact lens use (40 percent of users) (86).

The course of treatment for acne can be difficult for adolescents for other reasons. Weeks of treatment are frequently required before improvement is visible. In addition, some adolescents have difficulty effectively complying with complicated treatments that may involve washing their face several times a day, applying one solution to their skin in the morning and another at night, and taking oral antibiotics. Oral antibiotics are most effective when taken on an empty stomach, necessitating that adolescents remember to take their medication either an hour before or 2 hours after meals. Following such a regimen may be especially difficult for adolescents who snack throughout the day. Cosmetics, frequently used by girls to cover their blemishes, may actually exacerbate their acne. Thus, adolescents may become frustrated and give up on treatments that take weeks to show any effects, have undesirable side effects, do not actually cure their acne, and are complicated and time-consuming to administer (20).

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[43] The number of 10- to 12-year-olds visiting dermatologists was too small to make a reliable numerical estimate.

Photo credit: © American Academy of Dermatology

There is no cure for acne, an almost universal problem among adolescents. An estimated $124 million is spent each year on acne treatment. Health care providers should help adolescents understand that treatments designed to control the condition and prevent scarring may be slow to work, cause side effects, or even temporarily worsen an adolescent's appearance.

Health care providers may fail to recognize the difficulties that adolescents experience in adhering to treatment regimens. It is important that they emphasize the slow course and complicated nature of treatment, ensure that adolescents realize there is no cure, and advise adolescents of potential side effects, including the possibility of a temporary worsening in appearance (20).

Dysmenorrhea Among Adolescent Females

Primary dysmenorrhea (menstrual pain in the absence of anatomic pathology such as endometriosis[44]) usually has its onset in the first year or 2 following menarche, but its incidence increases through the adolescent period (11). Over half of those experiencing dysmenorrhea may experience moderate to severe menstrual cramps.

The 1966-70 NHES conducted by the U.S. Department of Health, Education, and Welfare included taking menstrual history of adolescent females ages 12 to 17 (94). Almost 60 percent of the adolescents in this study reported some degree of menstrual pain, and 14 percent reported frequent school absenteeism due to dysmenorrhea (43).[45] Although there are no current national population-based studies of the prevalence and effects of dysmenorrhea for adolescent females,[46] studies with small samples indicate that dysmenorrhea remains a leading contributor to school absenteeism for adolescent females. For example, one-fourth of the 88 high school females surveyed by Wilson and Keye reported that they had missed classes because of dysmenorrhea (120). A study involving middle-school students with excessive absences in Boston found that almost half of these students cited health problems as a reason for the absence; menstrual pain was one of the most frequently cited problems (44). Forty-five percent of 14- to 18-year-old adolescent females in two Midwestern communities reported some school or work absenteeism due to menstrual pain (39), and 59.7 percent of otherwise healthy females in an independent New England high school reported dysmenorrhea (119).

Even though the prevalence of dysmenorrhea appears to be high, less than 2 percent of visits to office-based physicians by adolescent females ages 15 to 18 are for "abdominal pain, cramps, or spasms" (which could possibly include menstrual cramps); fewer than 1 percent are for menstrual symptoms "other and unspecified" (101). Although the numbers are too low to be reliable because trouble with menstruation was reported for few adolescent females, 1988 NHIS data indicate that only 5.9 percent of females ages 5 to 18 (virtually all of whom must be age 10 or over) experiencing trouble with menstruation sought medical care. In comparison, 77.9 percent of women ages 18 to 44 with disorders of menstruation reported seeking medical care (101) .

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[44] Dysmenhorrea due to endometriosis or other anatomic pathology is termed *secondary dysmenorrhea*. According to Litt, endometriosis (a condition in which tissue resembling the uterine mucous membrane occurs aberrantly in various locations in the pelvic cavity) has been underdiagnosed in adolescent females (47), another reason for paying serious attention to menstrual pain.

[45] The parents of 2.5 percent of females ages 12 through 17 reported "genitourinary conditions" (no more specifics given) as having been the adolescents' most serious illness (94).

[46] NHIS, for example, provides a poor measure of menstrual problems experienced by adolescent females because many of the proxy respondents (e.g., mothers) may be unaware that the adolescent is experiencing problems. It seems likely that primarily the most severe difficulties, those resulting in medical intervention, will be reported. It is also difficult to use NAMCS data to assess the prevalence of dysmenorrhea because it only captures information on females who seek medical intervention for their menstrual cramps.

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Photo credit: Education Week

Menstrual pain (dysmenorrhea) is a frequently cited reason for missing school. Adolescent females may need to be informed that dysmenorrhea is physically, not psychologically, caused and that it is easily treatable.

Only recently has the medical profession recognized a physiological basis for menstrual pain: elevated concentration of menstrual prostaglandins that cause painful uterine contractions. As late as the 1980s, menstrual cramps were believed to be a psychosomatic complaint caused by poor attitudes of women about their femininity (11). Psychotherapy was seen as an appropriate response to the problem.

Now that a physiological basis is known, however, treatment for dysmenorrhea can usually be straightforward. Nonsteroidal anti-inflammatory drugs (e.g., salicylates such as aspirin, propionic acids such as ibuprofen and naproxen sodium) inhibit the production of prostaglandins and have been effective in reducing uterine contractions (11). Ibuprofen, previously available only by prescription, is now available over-the-counter.[47]

The low rates at which adolescent females seek care for dysmenorrhea may be due to beliefs by them, their mothers, or both that nothing can be done (39,48). Negative attitudes and erroneous beliefs may also be supported through misinformation received from peers and others. Because the medical community has only recently come to understand the physiological basis for dysmenorrhea (47), it is likely that some providers are not adequately informed about the importance of providing relief to young women suffering from menstrual cramps. Some of them, for example, may believe that exercise is an appropriate treatment, although recent evidence suggests that exercise is more directly associated with relieving stress which may reduce the intensity of dysmenorrhea (54). Even when providers are informed about the issues, they may not ask appropriate questions during health care visits to probe about suffering from this problem and to make appropriate interventions (39).

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[47] Thus, it may be that newer studies (conducted after ibuprofen was made more widely available) would indicate fewer problems with menstrual pain (39). This would only apply if more adolescents were aware that menstrual pain can be prevented or ameliorated.

Major Federal Policies and Programs Pertaining to Adolescents With Chronic Conditions

Federal efforts to address the needs of U.S. adolescents with chronic conditions include a Federal law requiring that education be provided to all handicapped children and a Federal law authorizing the provision of financial assistance to States and private nonprofit organizations that offer services to persons with "developmental disabilities." These efforts are managed by various Federal agencies within the U.S. Department of Education and DHHS.

Education for All Handicapped Children Act

Educational opportunities for U.S. adolescents with disabilities have been greatly enhanced by the Education for All Handicapped Children Act (Public Law 94-142), which was passed in 1975 and amended several times since then (e.g., Public Law 99-457 in 1986, Public Law 101-476 in 1990). This act is designed to guarantee free and appropriate public education for all children ages 3 to 21 with disabilities, including mental retardation; hearing, speech, vision, or orthopedic impairments; serious emotional impairments; autism; traumatic brain injury; multiple disabilities; specific learning disabilities and other health impairments (35; Public Law 101-476). Some Federal funds are provided to support these efforts, but State and local-educational agencies bear most of the burden.

The Education for all Handicapped Children Act also authorized a transition-from-school program for children and adolescents with disabilities. Amendments to the act in 1986 (Public Law 99-457) clarified that funded activities may serve students throughout their school years as well as those who have left secondary school, and it expanded the purposes of this provision to include improving vocational and life skills. The act also authorized funding for physical education and therapeutic recreation programs designed to increase community participation among adolescents with disabilities (89).

Developmental Disabilities Assistance and Bill of Rights Act

Services to persons with developmental disabilities are authorized through the Developmental Disabilities Assistance and Bill of Rights Act, which in 1970 amended the Mental Retardation Facilities and Community Mental Health Centers Construction Act of 1963 (Public Law 88-164) (91). The act authorizes Federal financial assistance to States and public and nonprofit agencies for programs that help people with developmental disabilities to achieve their full potential through increased independence, productivity, and integration into the community. Funded programs also provide assistance to the families of people with developmental disabilities.

Under the act, the definition of "developmental disabilities" is based on functional limitations rather than specific disorders. These limitations must be manifest before age 22; be attributable to a mental or physical impairment; be likely to continue indefinitely; and result in substantial limitations in three or more major life activities, such as self-care, learning, receptive and expressive language, and mobility. Each State is required to have a State planning council that receives funds under the act. State planning councils serve as advocates for people with developmental disabilities and develop a State plan that identifies unmet service needs and services to be provided. The act also requires States to have in place a protection and advocacy system to provide information and referral services and to investigate reports of abuse and neglect of people with developmental disabilities. University-affiliated programs provide interdisciplinary training for people preparing to work with persons with developmental disabilities, conduct applied research, provide technical assistance to agencies working with people with developmental disabilities, and provide services for people with developmental disabilities.

Other Federal Efforts

A new disabilities prevention program has been established within DHHS at the Centers for Disease Control (34). Efforts will focus on the areas of developmental disabilities, injuries to the head and spinal cord, and secondary complications among people with physical disabilities.

There are some tax code provisions designed to alleviate the financial burden on the families of people with disabilities (90). The costs of sending a dependent with mental or physical disabilities to a special school may be deducted if the main reason for using the school is that the school provides facilities for alleviating the handicap. The dependent-care tax credit can be claimed for expenses incurred in the care of a physically or mentally disabled dependent necessary for the primary care provider to be gainfully employed. This includes expenses for household services, day-care centers, and other noninstitutional care.

In addition, the U.S. Surgeon General has sponsored several campaigns and conferences on children and adolescents with special health care needs (formerly known as "crippled children") (see 24, 49,100). The 1989 Surgeon General's Conference focused specifically on issues for individuals with special health care needs making the transition between childhood and adulthood (49). A main focus of DHHS's Bureau of Maternal and Child Health is the dissemination of funds for programs assisting adolescents with disabilities.[48]

Conclusions and Policy Implications

Available data suggest that there may be more U.S. adolescents with physical health problems than is generally assumed. The most recent intensive health examination survey of a number of adolescents was the National Health Examination Survey (NHES) completed in 1970. This survey found that about 22 percent of U.S. adolescents had *some* illness, deformity, or physical handicap affecting normal growth, development, or function (94,95). Although not all of these were serious and chronic conditions, they were judged to interfere with healthy adolescent development in some way.

As discussed in this chapter, OTA estimates (using Gortmaker and Sappenfield's work) that roughly 5 percent of today's U.S. adolescents experience chronic physical conditions that make them physically unable to carry on major activity (e.g., attending school) or limit the amount or kind of major activity they can perform.

Little can be done during adolescence to prevent many of the serious chronic physical illnesses of adolescence.[49] In the absence of effective preventive interventions, attention to treatment and to issues affecting the quality of life of affected adolescents is particularly important. Although adolescents with chronic illnesses and disabilities experience many of the same problems as their nondisabled peers, such adolescents face a number of additional problems. These range from concerns that are specific to certain chronic illnesses (e.g., the devastating effects of chemotherapy and radiation associated with cancer treatment) to concerns that are associated with a variety of chronic illnesses (e.g., problems related to having to be absent from school, difficulties in socializing with peers, and substantial economic costs for families and for society). Adolescents with some chronic illnesses or disabilities may have limited options for employment and marriage, may be unable to (or choose not to) have children, and may experience discrimination in obtaining life and health insurance.

Another problem is that even for families with adequate health insurance, many of the often substantial costs associated with care of adolescents with chronic conditions are not covered. As discussed elsewhere in this Report, there is generally a scarcity of personnel trained to provide services to adolescents and services for adolescents tend to be fragmented.[50] The problems of fragmentation are compounded for adolescents with a serious chronic condition, who are typically in need of a broad range of often specialized services. Additional personnel trained to identify the needs of adolescents with chronic illnesses and disabilities, and to provide them with services, are needed.

Some chronic physical health problems of U.S. adolescents are so common that they may be accepted by parents, health care providers, and policymakers as "normal" and not worthy of mention or intervention. Adolescents, on the other hand, may find them extremely troubling. Acne and dysmenorrhea are examples. The vast majority of U.S. adolescents experience common acne which, although not physically disabling, negatively affects the day-to-day lives of many adolescents. Evidence from a variety of sources suggests that at least half of adolescent females report dysmenorrhea (painful menstruation) and about 1 in 7 miss school because of this pain. Dysmenorrhea is a problem that, in most cases, could be alleviated through the use of certain over-the-counter drugs. It appears that adolescents are not routinely made aware of current information about the causes of these and other disorders of importance to them, or of the fact that treatment is available.

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[48] For further discussion of the role of the Bureau of Maternal and Child Health in adolescent health, see ch. 19, "The Role of Federal Agencies in Adolescent Health," in Vol. III.

[49] As noted earlier, many physical health problems due to injuries *are* preventable. For further discussion, see ch. 5, "Accidental Injuries: Prevention and Services," in this volume.

[50] See ch. 15, "Major Issues Pertaining to the Delivery of Primary and Comprehensive Health Services to Adolescents," and ch. 19, "The Role of Federal Agencies in Adolescent Health," in Vol. III.

There is no single comprehensive source of information about the physical health status of U.S. adolescents. Rather, a variety of sources must be used to identify the most important physical health problems facing adolescents. National surveys sponsored by the National Center for Health Statistics in DHHS that provide information on the health of adolescents include NHIS, NHDS, and NAMCS, but these data sources have a variety of limitations. Most do not include large enough samples of adolescents to provide reliable data on low-prevalence chronic conditions. Furthermore, NHDS and NAMCS measure utilization of services (e.g., the number of adolescents with hospital stays or visits to physicians' offices) rather than need. Thus, adolescents who do not seek care for services, or who use alternative services, are not included in the surveys. These data may disproportionately exclude racial and ethnic minority adolescents and poor adolescents who may not have access to services.[51]

National surveys do provide some information on differences in health status or health care utilization among adolescents of different ethnic or racial groups, between males and females, and among adolescents of varying socioeconomic status, but much of this information is not reliable for policymaking purposes because of limitations in these data sources (e.g., small sample sizes of minority adolescents). There are virtually no population-based data on the health status of minority adolescents and their utilization of health services. Even when minority groups are oversampled in some national surveys, the number of minority adolescents remains small. Similar problems exist for describing the health of adolescents living in poverty. Although some useful data are collected on socioeconomic status and health,[52] sufficient data are rarely collected to allow for analyses to determine the nature of relationships between socioeconomic status and health. Additional information is particularly needed on the health status of these groups of adolescents and their utilization of services.

As described elsewhere in this Report, programs related to adolescents with chronic illness and disability can be found in a wide range of Federal agencies and departments.[53] These include the U.S. Department of Education and, within DHHS, the Centers for Disease Control; the National Cancer Institute; the National Heart, Lung, and Blood Institute; the National Institute of Allergy and Infectious Diseases; the National Institute of Arthritis and Musculoskeletal and Skin Diseases; the National Institute of Neurological Disorders and Stroke; and the Office of Human Development Services. There is, however, no central place in the Federal Government that coordinates programs for children and adolescents with chronic illness or disability.

In summary, policy changes to improve the physical health of U.S. adolescents might include:

- improved data collection,
- additional support for coordinated services and services to improve the quality of life for adolescents with serious chronic physical conditions, and
- health education on issues of importance to adolescents.

NHANES III currently in the field will oversample children, but includes relatively few adolescents and will not include institutionalized adolescents. NAMCS, NHDS, and NHIS (which are conducted more regularly than the infrequent NHANES) could oversample so that more adolescents of a greater racial, ethnic, and economic diversity are included. Population-based interview surveys would be improved if they asked adolescents about their own health problems rather than relying on parents as reporters of this information and if they included problems of importance to adolescents.

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[51] See ch. 18, "Issues in the Delivery of Services to Selected Groups of Adolescents," in Vol. III.

[52] Some data, for example, are collected as part of the National Health Interview Survey. However, this survey is limited because adolescents themselves are not asked about their health problems.

[53] See ch. 19, "The Role of Federal Agencies in Adolescent Health," in Vol. III.

Adolescents who have serious chronic physical conditions are in need of a broad range of often specialized services. Additional personnel trained to identify the needs of adolescents with chronic illnesses and disabilities, and to provide them with services, are also needed. Many adolescents with chronic physical illnesses may be in need of supportive or mental health services, for example.

Although recent Federal efforts have addressed the needs of children and adolescents with special health care needs, there is no central place in the Federal Government that coordinates programs for adolescents with chronic illness or disability. More active support for the development and evaluation of programs, as well as for efforts to coordinate available programs, is needed.

Finally, health education for adolescents could be improved if it addressed health issues of importance to adolescents and provided information on how to get access to medicine and services.

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NUTRITION AND FITNESS PROBLEMS: PREVENTION AND SERVICES

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Chapter 7

NUTRITION AND FITNESS PROBLEMS: PREVENTION AND SERVICES[1]

Introduction

Adolescence[2] is a period of biological and social change, and because of the changes that they undergo (e.g., in their size, body composition, body functions, physical abilities, and life styles) and other individual factors, adolescents as a group and as individuals have special nutritional and, possibly, fitness needs. Nutrition and physical activity during adolescence can influence the process of physical growth and development. Evidence concerning the impact of adolescent dietary patterns on the occurrence of chronic diseases in adulthood is very limited, but there is some evidence to suggest that dietary patterns are important factors in the occurrence of some major chronic diseases (e.g., atherosclerotic cardiovascular diseases and hypertension, certain forms of cancer, obesity, non-insulin-dependent diabetes, and dental caries) and that dietary modifications can reduce the risk of some of these diseases (152).

The changing nutritional needs and physical abilities of adolescents as a group are addressed in this chapter, as are the nutritional and other needs of certain subgroups of adolescents (e.g., adolescents with diabetes, adolescents with physical disabilities). Also described in this chapter are selected Federal programs related to the nutritional health and physical fitness status of U.S. adolescents. The chapter ends with conclusions and implications for public policy.

Background on Adolescent Nutrition and Fitness

Adolescents' Nutritional and Physical Fitness Needs

Definitional Issues

Good nutrition is a somewhat elusive concept not easily defined or determined. It is generally agreed, however, that good nutrition embraces the principles of sufficiency, variety, balance, and moderation (59a). Especially in large population groups, research tools cannot capture or interpret all the interrelated aspects of food intakes and nutritional outcomes; most studies instead focus on substitute measures (e.g., specific nutrient consumption or dietary attitudes).

Physical fitness is defined in various ways. In the not too distant past, a person with obvious motor (or athletic abilities)—defined in terms of muscle strength, agility, speed, and power—was considered "physically fit." Recently, however, the concept of physical fitness has been undergoing a major change. According to a 1987 American Academy of Pediatrics statement, physical fitness is now considered to include five components: 1) muscle strength, 2) muscle endurance, 3) flexibility, 4) body composition (i.e., ratio of lean body mass to fat), and 5) cardiorespiratory endurance (4). Many available studies focus on proxy measures of fitness, such as performance on standardized tests of fitness.

Several major Federal sources of data on nutritional status, food and nutrient consumption, and other information related to adolescent nutrition are identified in box 7-A.

Nutritional Needs

The human body requires for health the intake of water, amino acids from protein, vitamins, minerals, fatty acids, and sources of calories (protein, carbohydrate, and fat) (226) (see box 7-B).

A physiologic diet provides intakes of each essential nutrient between the two thresholds of minimal requirement and maximal tolerance (186). The *minimal requirement* is defined as the smallest quantity of an essential nutrient that "maintains normal mass, chemical composition, morphology, and physiologic functions of the body and prevents any clinical or biochemical sign of the correspond-

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[1] This chapter is not an exhaustive compendium of all adolescent nutrition and fitness issues. Instead, its purpose is to focus on what appear to be the major problems associated with nutrition and fitness affecting many American adolescents.

[2] The focus of this OTA Report, for reasons noted in Vol. I, *Summary and Policy Implications*, is on 10- through 18-year-olds. Some of the data presented in this chapter are for other age groupings, because data for 10- through 18-year-olds are not readily available.

Box 7-A—Federal Data Collection Efforts Related to Adolescent Nutrition

Several federally sponsored national surveys[1] gather information on health and nutritional status measurements,[2] food and nutrient consumption measurements, food composition measurements, dietary knowledge and attitude assessments, food supply determinations, sociodemographic and economic measurements, and other relevant data. A number of the surveys sponsored by the U.S. Department of Health and Human Services and the U.S. Department of Agriculture are discussed below. Several of the surveys are components of the National Nutritional Monitoring System, a Federal assessment system that allows continuous nutrition monitoring through complementing; periodic surveys.

U.S. Department of Health and Human Services (DHHS):[3]

- *National Health and Nutrition Examination Survey (NHANES)*: NHANES is one component of the National Nutrition Monitoring System. This survey, conducted by the National Center for Health Statistics (NCHS) in DHHS, obtains health-related data by means of direct physical examination, clinical and laboratory tests, and related measurement procedures (232). A major goal of NHANES I (1971-74) was to measure and monitor indicators of the nutritional status of the America people through dietary intake data, biochemical tests, physical measurements, and clinical assessments for evidence of nutritional deficiency. The target population was the civilian, noninstitutionalized U.S. population ages 1 through 74. *NHANES II* (1976-80) had a nutrition component that was nearly identical to the NHANES I. Neither NHANES I nor NHANES II had an adequate adolescent sample. *NHANES III* is now in progress. It is collecting some adolescent-specific data, but results are not expected until 1994.
- *Hispanic HANES* (1982-84): NCHS conducted this survey on about 76 percent of the Hispanic adult population (187).
- *National Health Interview Survey (NHIS):* This survey, conducted by NCHS, uses personal household interviews to collect data on personal and demographic characteristics, utilization of health resources, and a variety of health topics from a sample of the civilian, noninstitutionalized U.S. population. It will include a special supplement on adolescent health in 1991, 1995, and 2000.
- *Total Diet Study*: This study, by the Food and Drug Administration, gathers information on intakes of pesticides, toxic substances, radionuclides and industrial chemicals, as well as or intakes of iodine, iron, sodium, potassium, copper, magnesium, and zinc, for males and females ages 6 to 11 months, 2 years, 14 to 16 years, 25 to 30 years, and 60 to 65 years.
- *Youth Risk Behavior Surveillance System (YRBSS)* (to be implemented in 1991, 1995, and 2000): This system, recently developed by the Centers for Disease Control in DHHS, will monitor the prevalence of

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[1] For a listing of Federal nutrition monitoring and surveillance activities, see *Nutrition Monitoring in the United States: The Directory of Federal Nutrition Monitoring Activities* (243).

[2] In general, the validity and reliability of results of dietary and of nutritional status assessments vary (methods may be well-tested but are limited (58)). Also, errors of interpretation of dietary intake data are common (18).

[3] Further details on the DHHS system are provided in a report on the National Nutritional Monitoring System (256).

ing deficiency state'' (186). In children and adolescents, the minimal requirement also must meet an additional criterion: it must maintain an optimal rate of growth (186). The *maximal tolerance* for an essential nutrient is an important consideration for individuals taking dietary supplements, which may be harmful at certain levels. Factors that influence the minimal requirement and maximal threshold for a nutrient include rate of growth, age, exercise, chemical composition of the diet, presence of certain diseases or physical conditions (e.g., diabetes, pregnancy), and intake of prescription drugs (186).

Nutritional needs during adolescence correlate closely with biological maturity (140). Adolescents should consume diets providing more total nutrients than younger children (131,203), because adolescents typically have a larger body and different body composition (e.g., a different ratio of lean body mass to fat). Adolescents experience gains in height and weight that alter their nutritional needs (see table 7-1). Females typically experience a pubertal height spurt between ages 10 and 13, and males experience a height spurt between ages 12 and 15 (200). This growth requires nutrients as structural materials. Changes in physiologic function that occur during priority risk behaviors among samples of school-aged adolescents by collecting data from a periodic school-based survey combined with special supplemental data from NHIS on youth risk behavior.

U.S. Department of Agriculture (USDA):

- *Nationwide Food Consumption Survey (NFCS)*: This survey is one component of the National Nutrition Monitoring System. Conducted by USDA's Human Nutrition Information Service every 10 years, NFCS collects information on the general and low-income U.S. population ages 0 to 75 years and older (213a). The most recent survey, conducted in 1987-88, included the collection of information on foods used by households and eaten by individuals.
- *Continuing Survey of Food Intakes by Individuals (CSFII)*: This survey, like NFCS, is part of the National Nutritional Monitoring System. It is conducted by USDA's Human Nutrition Information Service. Initiated in 1985, it is designed to measure levels and changes in the food and nutrient content and nutritional adequacy of U.S. diets on a continuing basis (213a). In 1985 and 1986, the CSFII included all-income and low-income samples of women 19 to 50 years of age and their children 1 to 5 years of age. In 1985, the survey also included men 19 to 50 years of age. The CSFII was not conducted in 1987 and 1988. The 1989, 1990, and 1991 samples included men, women, and children of all ages. All CSFII samples are drawn from households in the 48 coterminus States and include a basic survey (households with incomes at any level) and a low-income survey (households with incomes at or below 130 percent of the Federal poverty level). The kinds and amounts of food ingested at home and away from home by individual household members are reported for 3 consecutive days using a 1-day recall in an in-person interview and a 2-day diary.
- *Diet and Health Knowledge Survey (DHKS)*: This survey, begun in 1989 as a followup to CSFII, targets "food managers" in households participating in CSFII. Its purpose is to link an individual's knowledge and attitudes about diet and health to his or her actual dietary behavior.
- *National Evaluation of School Nutrition Programs*: This survey, conducted only occasionally, provides information on U.S. adolescents' eating patterns and use of school nutrition programs.

Federally sponsored national surveys have several positive features:

- the surveys provide population-based parameters of current nutritional status,
- the surveys identify some groups at risk and their nutritional problems; and
- the surveys contribute useful population-based information for national planning purposes.

On the other hand, federally sponsored national surveys have a number of limitations including the following:

- Neither NHANES nor NFCS provides data on energy expenditures and fitness status.
- Subgroup sample sizes are not large enough to permit analyses and cross-tabulations using several variables (e.g., income, race, and sex); that is, adolescents with combinations of problems are not sufficiently targeted.
- Because of high nonresponse rates among very low-income, non-English-speaking people and because adolescents living in institutional settings are not included in the surveys, some problems may be underestimated.
- Nutritional status data are collected only periodically.

adolescence also alter adolescents' nutritional requirements. U.S. females, for example, typically begin menstruating at age 12½. Females who start menstruating have an increased requirement for iron due to menstrual losses (200,211). Changes in lifestyle, especially in physical activity, may also affect adolescents' nutrient needs (142). Male or female adolescents who regularly participate in vigorous physical activity, for example, increase their energy needs.

Nutritional needs for male and female adolescents of the same age are typically quite different because of factors that include differences in body composition and function (90). But even adolescents of the same sex and age may have different nutritional needs. Adolescents mature at different rates, sometimes as a consequence of genetic endowment and sometimes as a result of environmental factors (e.g., chronic undernutrition slows height and weight growth and slightly delays puberty). Furthermore, as discussed later, some adolescents have diseases or special conditions (e.g., diabetes, thyroid conditions, or pregnancy) that alter their nutritional needs by changing the absorption, metabolism, or excretion of particular nutrients (212).

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Box 7-B—Biological Functions of Dietary Substances

Protein—Dietary protein provides a mixture of amino acids to replace the body's continuous degradation of these substances and is also a metabolic fuel for energy. Sufficient protein intake is important for body growth, hair growth, blood and organ mass, muscle development, and proper balance of hormones and body fluids.

Vitamins

Vitamin A—A group of compounds essential for vision, growth, cellular differentiation and proliferation, reproduction, and integrity of the immune system.

Vitamin D—Essential for proper formation of the skeleton and for mineral equilibrium.

Vitamin E—Inhibits the oxidation of essential cell constituents and prevents the formation of toxic oxidation products. Primary deficiency of vitamin E is not found in otherwise healthy humans because of the wide distribution of the vitamin in foods, but secondary deficiency (which may result from intestinal malabsorption) is associated with reproductive failure, muscular dystrophy, and neurological abnormalities.

Vitamin K—Essential for the formation of proteins involved in the regulation of blood clotting, and for the biosynthesis of some other proteins found in the plasma, bone, and kidney.

Vitamin C—Required for the formation and synthesis of collagen (an abundant protein of connective tissue). Deficiency may affect immune responses, wound healing, iron absorption, and allergic reactions. Often vitamin C deficiency results in scurvy, a serious disease in which the weakening of collagenous structures leads to capillary hemorrhaging.

Thiamin (B-1)—Involved in the breakdown of carbohydrates. Deficiency can lead to beriberi, a disease affecting the cardiovascular and nervous systems and characterized by symptoms including mental confusion, muscle weakness, enlarged heart, and congestive heart failure.

Riboflavin (B-2)—Participates in a variety of oxidation-reduction reactions and essential to the structure of some enzymes. Among the symptoms of deficiency are sore throat, excess blood and fluid in the mucous membranes, and angular stomatitis.

Niacin—Also involved in oxidation-reduction reactions. Deficiency is associated with skin rashes, swelling and reddening of the tongue, dermatosis, diarrhea, and dementia.

Vitamin B-6—Important in the metabolism of amino acids. Deficiency leads to dermatitis and depression in adults and seizure in infants.

Folate—Designates a compound that plays an important role in amino acid metabolism and nucleic acid synthesis. Deficiency leads to impaired cell division and alterations of protein synthesis.

Vitamin B-12—Essential to metabolism. Deficiency can cause pallor, weight loss, diarrhea, optic neuritis, and mental changes.

An important dietary standard used in the United States is the recommended dietary allowances (RDAs), established by the Food and Nutrition Board of the National Academy of Sciences (NAS) (153). The 1989 RDAs for protein, vitamins, and minerals for U.S. males and females ages 11 to 14, ages 15 to 18, and ages 19 to 24 are specified in table 7-2. RDAs are recommendations for daily dietary intakes of specific nutrients, based on nutritional studies and expert judgment.[3] They are neither minimal requirements nor necessarily optional levels of intake. Rather, they are "the levels of intake of essential nutrients that, on the basis of scientific knowledge, are judged by the Food and Nutrition Board to be adequate to meet the known nutrient needs of practically all healthy people" (153).[4]

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[3] In principle, RDAs are based on various kinds of evidence: 1) studies of subjects maintained on diets containing low or deficient levels of a nutrient, followed by correction of the deficit with measured amounts of the nutrient; 2) nutrient balance studies that measure nutrient status in relation to intake; 3) biochemical measurements of tissue saturation or adequacy of molecular function in relation to nutrient intake; 4) nutrient intakes of fully breastfed infants and of apparently healthy people from their food supply; 5) epidemiological observations of nutrient status in populations in relation to intake; and 6) in some cases, extrapolation of data from animal experiments. In practice, there are only limited data on which estimates of nutrient requirements can be based (153).

[4] RDAs apply to healthy persons only and do not cover special nutritional needs arising from metabolic disorders, chronic diseases, or other medical conditions or drug therapies (153).

Minerals

Calcium—Essential for bone mineral formation. Bone undergoes constant resorption and formation throughout life. In childhood and adolescence, dietary calcium helps to build strong bones; in adults, when bone resorption exceeds formation, it slows the rate of bone loss.

Phosphorus—An essential component of all cell protoplasm, aiding in biochemical synthesis and energy transfer. Phosphorus is a constituent of nervous tissue and bone.

Magnesium—Modulates numerous biochemical and physiological processes. Deficiency may cause growth failure, behavioral disturbances, weakness, tremor, seizures or cardiac arrhythmias.

Iron—A constituent of blood and a number of enzymes. Anemia and reduced resistance to infection are among the symptoms of deficiency.

Zinc—A constituent of enzymes involved in most major metabolic pathways. Zinc intake affects appetite, growth, skin, and the immune system.

Iodine—Essential part of the thyroid hormones. Deficiency can cause swelling of the thyroid gland (goiter), and excessive intake can cause depression of thyroid activity.

Lipids

Fats—Fats are an important energy source and help to facilitate the intestinal absorption of vitamins A, E, and D. Saturated and monounsaturated fats, however, are not essential to the diet because they can be synthesized by the body. Polyunsaturated fats are essential components of the diet, functioning as precursors to important structural lipids such as those found in cell membranes.

Cholesterol—Cholesterol is an important component of all cell membranes and a precursor to steroid hormones and bile acids in the liver, but is not essential to the diet because it can be synthesized by the body.

Salt—Serves as the primary regulator of extracellular body fluid volume. It is also important in regulating acid-base balance and the membrane potential of cells, and is involved in active transport across cell membranes.

Calories—A calorie is a unit of quantity of heat, used to express the energy value of food. Energy requirements vary according to body size and composition, and level of physical activity. The level of energy intake from food balances energy expenditures and allows for necessary or desirable levels of physical activity. In children and pregnant or lactating women energy is also needed for the deposition of tissues or secretion of milk. If calorie intake is consistently above or below an individual's requirement, changes in body weight and composition will result.

SOURCES: Office of Technology Assessment, 1991, based on the following sources: National Academy of Sciences, National Research Council, *Recommended Dietary Allowances*, 10th ed. (Washington, DC: National Academy Press, 1989); E. Braunwald, K.J. Isselbacher, R.G. Petersdorf, et al. (eds.), *Harrison's Principles of Internal Medicine*, 11th ed. (New York, NY: McGraw-Hill Book Co., 1988).

In practice, there are only limited data on which estimates of nutrient requirements can be based (153). Traditionally, RDAs have been established for essential nutrients only when there are sufficient data to make reliable recommendations. For several nutrients for which there is insufficient information on which to base an RDA, the NAS Food and Nutrition Board publishes estimated safe and adequate ranges of daily intakes, as shown in table 7-3.

In addition to listing RDAs for protein, vitamins, and minerals, the NAS publication *Recommended Dietary Allowances* lists recommended daily energy intake levels (caloric intake) for persons of median height and weight (153). Recommended energy intakes for U.S. males and females ages 11 to 24 of median heights and weights, by age and sex, are shown in table 7-4. The principal dietary sources of energy are carbohydrates, fat, and protein (153). Energy needs vary from person to person. An individual's energy requirements depend on how much energy the individual expends at rest, in physical activity, and as a result of the body's adaptive response to heat (153). These, in turn, are affected by variables that include age,[5] sex, body size and composition, genetic factors, energy intake, physiologic state (e.g., growth, pregnancy, lactation), coexisting pathological conditions, and ambi-

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[5] Resting energy expenditure is closely correlated with lean body mass, and this varies by age. Activity patterns also vary by age.

Table 7-1—Weight and Height of U.S. Males and Females Ages 10 to 18[a]

	Males, by percentile							
	Weight, in kg (lb)				Height, in cm (in)			
Age	5th	50th		95th	5th	50th		95th
10	24.33	31.44	(69.2)	45.27	127.7	137.5	(54.1)	148.1
11	26.80	35.30	(77.7)	51.47	132.6	143.3	(56.4)	154.9
12	29.85	39.78	(87.5)	58.09	137.6	149.7	(58.9)	162.3
13	33.64	44.95	(98.9)	65.02	142.9	156.5	(61.6)	169.8
14	38.22	50.77	(111.7)	72.13	148.8	163.1	(64.2)	176.7
15	43.11	56.71	(124.8)	79.12	155.2	169.0	(66.5)	181.9
16	47.74	62.10	(136.6)	85.62	161.1	173.5	(68.3)	185.4
17	51.50	66.31	(145.9)	91.31	164.9	176.2	(69.4)	187.3
18	53.97	68.88	(151.5)	95.76	165.7	176.8	(69.6)	187.6

	Females, by percentile							
	Weight, in kg (lb)				Height, in cm (in)			
Age	5th	50th		95th	5th	50th		95th
10	24.36	32.55	(71.6)	47.17	127.5	138.3	(54.4)	149.5
11	27.24	36.95	(81.3)	54.00	133.5	144.8	(57.0)	156.2
12	30.52	41.53	(91.4)	60.81	139.8	151.5	(59.6)	162.7
13	34.14	46.10	(101.4)	67.30	145.2	157.1	(61.9)	168.1
14	37.76	50.28	(110.6)	73.08	148.7	160.4	(63.1)	171.3
15	40.99	53.68	(118.1)	77.78	150.5	161.8	(63.7)	172.8
16	43.41	55.89	(123.0)	80.99	151.6	162.4	(63.9)	173.3
17	44.74	56.69	(124.7)	82.46	152.7	163.1	(64.2)	173.5
18	45.26	56.62	(124.6)	82.47	153.6	163.7	(64.4)	173.6

[a] The data in this table were collected from nationally respective samples of individuals in three studies conducted by the National Center for Health Statistics of DHHS between 1962 and 1974. It is not intended that the figures in this table necessarily be considered standards of normal growth and development.

SOURCE: Adapted from P.V.V. Hamill, T.A. Drizd, C.L. Johnson, et al., "Physical Growth: National Center for Health Statistics," *American Journal of Clinical Nutrition* 32:607-609, 1979, cited in National Academy of Sciences, National Research Council, *Diet and Health: Implications for Reducing Chronic Disease Risk* (Washington, DC: National Academy Press, 1989). Reprinted by permission.

Table 7-2—NAS Recommended Dietary Allowances (RDAs) for Protein, Vitamins, and Minerals for U.S. Males and Females Ages 11 to 24, 1989[a]

	RDAs for males (by age)			RDAs for females (by age)		
Nutrient and unit of measurement	11-14	15-18	19-24[b]	11-14	15-18	19-24[b]
Protein, gm[c]	45	59	58	46	44	46
Vitamins						
Vitamin A, micrograms RE[d]	1,000	1,000	1,000	800	800	800
Vitamin D, micrograms	10	10	10	10	10	10
Vitamin E, mg	10	10	10	8	8	8
Vitamin K, micrograms	45	65	70	45	55	60
Vitamin C, mg	50	60	60	50	60	60
Thiamin, mg	1.3	1.5	1.5	1.1	1.1	1.1
Riboflavin, mg	1.5	1.8	1.7	1.3	1.3	1.3
Niacin, mg NE[e]	17	20	19	15	15	15
Vitamin B-6, mg	1.7	2.0	2.0	1.4	1.5	1.6
Folate, micrograms	150	200	200	150	180	180
Vitamin B-12, micrograms	2.0	2.0	2.0	2.0	2.0	2.0
Minerals						
Calcium, mg	1,200	1,200	1,200	1,200	1,200	1,200
Phosphorus, mg	1,200	1,200	1,200	1,200	1,200	1,200
Magnesium, mg	270	400	350	280	300	280
Iron, mg	12	12	10	15	15	15
Zinc, mg	15	15	15	12	12	12
Iodine, micrograms	150	150	150	150	150	150
Selenium, micrograms	40	50	70	45	50	55

[a] Nutritional requirements vary among individuals as a consequence of numerous genetic and environmental circumstances: RDAs are intended to provide for the needs of most healthy individuals living in the United States under normal environmental stresses (186).

[b] The focus of this OTA Report is on 10- through 18-year-olds. RDAs for 19- to 24-year-olds are provided in this table for the purpose of comparison.

[c] Healthy adults require nine essential amino acids in varying amounts each day. Dietary protein provides a mixture of amino acids for endogenous protein synthesis and is also a metabolic fuel for energy (186).

[d] RE = retinol equivalents. One RE is equal to 1 microgram of retinol or 6 micrograms of beta-carotene.

[e] NE = niacin equivalent. One NE is equal to 1 mg of niacin or 60 mg of dietary tryptophan.

SOURCE: Adapted from National Academy of Sciences, National Research Council, *Recommended Dietary Allowances*, 10th ed. (Washington, DC: National Academy Press, 1989). Reprinted by permission.

Table 7-3—NAS Estimated Ranges of Safe and Adequate Daily Dietary Intakes of Additional Vitamins and Minerals for U.S. Adolescents Ages 11 and Over[a]

Vitamin or mineral	Estimated range of safe and adequate daily dietary intake
Vitamins	
Biotin	30 to 100 micrograms
Pantothenic acid	4 to 7 mg
Trace elements[b]	
Copper	1.5 to 2.5 mg
Manganese	2.0 to 5.0 mg
Fluoride	1.5 to 2.5 mg
Chromium	50 to 200 micrograms
Molybdenum	75 to 250 micrograms

[a] For vitamins and minerals for which there is insufficient information on which to base an RDA, NAS publishes estimated ranges of safe and adequate daily dietary intakes.

[b] According to NAS, since the toxic levels for many trace elements may be only several times usual intakes, the upper levels for the trace elements given in this table should not be habitually exceeded.

SOURCE: Adapted from National Academy of Sciences, National Research Council, *Recommended Dietary Allowances*, 10th ed. (Washington, DC: National Academy Press, 1989), p. 284. Reprinted by permission.

ent temperature (153). While RDAs for protein, vitamins, and minerals are high enough to meet an upper level requirement encompassing individual variability, the recommended energy allowance reflects the *average* population requirement for each age group (153) and will not be sufficient for an individual who regularly engages in strenuous physical activity. Raising the recommended energy intake level to accommodate individuals with an upper level requirement, however, would be inappropriate because it could lead to obesity in persons with average requirements. Noting the great variability in the timing and magnitude of the adolescent growth spurt and in adolescent activity patterns, NAS emphasizes that its recommended energy intake levels for adolescents can be adjusted individually to take such variability into account (153).

From birth to age 10, the energy needs of males and females are not very different (153). After age 10, separate allowances are made for males and

Table 7-4—NAS Recommended Energy Intakes for Males and Females Ages 11 to 24 of Median Weights and Heights, 1989[a]

	Males				Females			
			Energy intakes				Energy intakes	
Age[b]	Median weight (kg)	Median height (cm)	Calories per kg of body weight	Total calories per day	Median weight (kg)	Median height (cm)	Calories per kg of body weight	Total calories per day[c]
Age 11-14	45	157	55	2,500	46	157	47	2,200
Age 15-18	66	176	45	3,000	55	163	40	2,200
Age 19-24	72	177	40	2,900	58	164	38	2,200

[a] Energy requirements of individuals are affected by several variables, including level of physical activity, age, sex, body size and composition, genetic factors, physiologic state (e.g., growth, pregnancy, lactation), coexisting pathological conditions, and ambient temperature. Recommended energy allowances, in contrast to RDAs for other nutrients (see table 7-2), are intended to meet the average needs of individuals.

[b] The focus of this OTA Report is on 10- through 18-year-olds. Recommended energy intakes for 19- to 24-year-olds are provided in this table for the purpose of comparison.

[c] For pregnant females and for females who are breastfeeding, the recommended energy intakes are higher (300 calories more per day for pregnant females in the second and third trimesters of pregnancy and 500 calories more per day for lactating females in the first year).

SOURCE: Adapted from National Academy of Sciences, National Research Council, *Recommended Dietary Allowances*, 10th ed. (Washington, DC: National Academy Press, 1989), p. 33. Reprinted by permission.

females because of differences in the age of puberty, evolving activity patterns, and body composition. On average, energy needs for adolescent males are higher than for females. Pregnant and lactating females have higher food energy needs than other females, as shown in table 7-4.

Data on the role of diet as a causal or contributing factor in chronic diseases have led some groups to issue dietary recommendations derived through approaches other than those used in developing RDAs for specific nutrients (153). Broad nutritional guidelines that provide guidance beyond that provided by RDAs were issued in the NAS report *Diet and Health: Implications for Reducing Chronic Disease Risk* (152), in *The U.S. Surgeon General's Report on Nutrition and Health* (242), and in *Nutrition and Your Health: Dietary Guidelines for Americans* published by the U.S. Department of Agriculture (USDA) and the U.S. Department of Health and Human Services (DHHS) (227). Those guidelines are summarized in box 7-C.

Among other things, these guidelines suggest restricting intakes of fat, saturated fat, cholesterol, sodium, sugar, and alcohol. Populations with high fat diets have more heart disease, certain types of cancer, and obesity (226). A diet low in saturated fatty acids and cholesterol can help maintain a desirable level of blood cholesterol, possibly reducing the risk for heart disease (226). Eating a diet with less salt (which contains sodium) may help some people reduce their risk of developing hypertension (high blood pressure). Sugars supply calories but are limited in essential nutrients and may increase the risk of tooth decay. Drinking alcohol is linked with a variety of chronic and other health problems (e.g., liver disease, accidental injuries).[6]

The guidelines in box 7-C also suggest that diets include plenty of vegetables, fruits, and grain products. Vegetable and fruits are good sources of vitamins A and C, folic acid, fiber and minerals (226). Breads and cereals provide B vitamins, iron, protein, and dietary fiber. Over the last decade, several organizations have recommended increasing the intake of complex carbohydrates or dietary fiber (153). The consumption of a fiber-rich diet promotes normal elimination and may have other beneficial effects (e.g., reducing blood cholesterol levels, preventing colon cancer and diabetes) (153).

Finally, it should be noted that USDA and DHHS' *Dietary Guidelines for Americans* recommends maintaining a healthy weight (227). Being too fat or too lean (a less common problem in the United States) increases the risk of various health problems. Available knowledge also suggests that whether one's weight is "healthy" depends on how much of one's body weight is fat, where in the body the fat is located, and whether one has weight-related medical problems or a family history of such problems (226).

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[6] Adolescents' dental health status is discussed in ch. 8, "Dental and Oral Health Problems: Prevention and Services," in this volume; adolescents' use of alcohol is discussed in ch. 12, "Alcohol, Tobacco, and Drug Abuse: Prevention and Services," in this volume.

Box 7-C—Broad Nutritional Guidelines That Provide Guidance Beyond Recommended Daily Allowances (RDAs)

National Academy of Sciences' Diet and Health Report (1989):

This report made recommendations for quantities of nutrients and numbers of suggested servings from some food groups, specifically:

- Limit intake of fat to less than 30 percent of total calories.
- Limit intake of saturated fatty acids to less than 10 percent of total calories.
- Limit cholesterol intake to under 300 mg daily.
- Limit salt intake to under 6 grams daily.
- Maintain protein at moderate levels, not more than twice recommended daily allowance (RDA).
- For those who drink alcoholic beverages, limit intake to less than 1 oz of pure alcohol per day.[1]
- Maintain optimal intake of fluoride.
- Avoid the use of dietary supplements in levels greater than RDA.
- Have 5+ servings of vegetable and fruit combinations, especially green and yellow vegetables and citrus fruits.
- Have 6+ daily servings of a combination of breads, cereals, legumes, and other starches and complex carbohydrates.

U.S. Surgeon General's Report on Nutrition and Health (1988):

This report endorsed USDA's *Dietary Guidelines for Americans* (those that were current at the time) and also recommended the following:

- that fluoridated community water systems, or other appropriate sources of fluoride be used to prevent tooth decay;[2]
- that those who are particularly vulnerable to dental caries should limit their consumption and frequency of foods high in sugar;[2]
- that adolescent females should increase consumption of foods high in calcium, including low-fat dairy products; and
- that adolescents and women of childbearing age, especially those in low-income families, be encouraged to consume foods that are good sources of iron.

USDA and DHHS' Dietary Guidelines for Americans (October 1990):

- Eat a variety of foods.
- Maintain healthy weight.
- Choose a diet low in fat, saturated fat, and cholesterol.
- Choose a diet with plenty of vegetables, fruits, and grain products.
- Use sugars in moderation.
- Use salt and sodium in moderation.
- If you drink alcoholic beverages, do so in moderation.[1]

The published guidelines provide more information on each guideline, including details on what the guideline means, how it is important to health, and some tips on using the guideline.

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[1] The consumption of alcohol by U.S. adolescents is discussed in ch. 12, "Alcohol, Tobacco, and Drug Abuse: Prevention and Services," in this volume.

[2] See ch. 8, "Dental and Oral Health Problems: Prevention and Services," in this volume for a discussion of the importance of fluoride to adolescents' dental health and other topics related to adolescents' dental health.

SOURCES: National Academy of Sciences, National Research Council, *Diet and Health: Implications for Reducing Chronic Disease* (Washington, DC: National Academy Press, 1989); U.S. Department of Health and Human Services, Public Health Service, Office of the Surgeon General, *Surgeon General's Report on Nutrition and Health* (Washington, DC: U.S. Government Printing Office, 1988); and U.S. Department of Agriculture and U.S. Department of Health and Human Services, *Nutrition and Your Health: Dietary Guidelines for Americans*, Home and Garden Bulletin, No. 232 (Hyattsville, MD: 1990).

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Researchers are developing more precise ways to measure healthy weight.[7]

Physical Fitness and Activity Needs

Numerous recent studies have suggested that physical fitness and/or physical activity[8] have, or potentially have, positive impacts on health and longevity (22,22a,33,33a,106a,171,174b,241). It is important to note, however, that these studies have had methodological flaws and have almost been conducted with adult samples. During adolescence, physical activity is thought to influence growth and development of skeletal bone, muscle, and fat (142). There appears to be a reciprocal relationship between physical activity and obesity or overweight (see below)..

Adolescents' Nutrition and Fitness Problems

A lack of data on contemporary adolescents and a paucity of systematic research on the impact of varying levels of nutrients and physical activity and fitness on health (including adolescent health) (254a) make conclusions about the nutrition and fitness problems of U.S. adolescents difficult to draw. Some survey data suggest that if one uses available nutritional and fitness *guidelines* as a standard, many U.S. adolescents have inadequate diets and engage in low levels of physical activity. Not coincidentally, a substantial minority are also overweight or obese. These problems may occur more often in some groups of adolescents, especially low-income adolescents or those in particular racial or ethnic groups.[9] Recent national data regarding the incidence or prevalence of these problems among U.S. adolescents are not available (see box 7-A), and national information about specific groups of adolescents (e.g., racial or ethnic minority adolescents, low-income adolescents) is practically nonexistent.

Nutritional Deficiencies

Essential nutrients are proteins, minerals, carbohydrates, fat, and vitamins that are necessary for growth, normal functioning, and maintaining life; they must be supplied by food, because they cannot be synthesized by the body (box 7-B). Table 7-5 shows U.S. adolescents' intake of food energy, protein, vitamins, and minerals in 1977-78 as a percentage of the 1980 RDAs.[10]

USDA's 1977-78 Nationwide Food Consumption Survey found that most U.S. adolescents got more than enough *protein* (see table 7-5). More recent data also confirm that intakes of protein by U.S. adolescents typically meet or exceed the RDA (111). USDA's 1977-78 Nationwide Food Consumption Survey also found that, on average, U.S. adolescents' intakes of vitamins A, B12, and C, thiamin, riboflavin, and niacin, were sufficient or more than sufficient. On the other hand, USDA's 1977-78 Nationwide Food Consumption Survey (224) found that U.S. adolescents' *energy intakes* (calories consumed) in the late 1970s were, on average, lower than the RDA levels.

The data in table 7-5 suggest that the nutrients U.S. adolescents are most likely to be getting insufficient quantities of include vitamin B-6, *iron* and *calcium*. Females ages 9 to 18 tended to consume less iron and calcium than males, but males, too, consumed less than the 1980 RDA. The RDA for *iron* in 1989 was lower than in 1980, but recent data support the finding that iron is one of the nutrients most likely to be deficient in U.S. adoles-

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[7] *Overweight* is sometimes defined as body mass index (BMI)—i.e., weight in kilograms divided by height in meters squared—greater than or equal to the 85th percentile of a similar population group. *Obesity*, a more serious problem, is defined in various ways. One definition is BMI greater than or equal to the 95th percentile of a similar population group. Another definition is weight at least 20 percent over "normal weight." Measuring triceps skinfolds is another way of measuring obesity.

[8] Physical *fitness* is an *attribute* that should be distinguished from physical *activity*, which is a *behavior*. Physical activity has been found to be an important determinant of physical fitness. To some extent, therefore, physical fitness can be considered to be an objective *marker* for habitual physical activity (and vice versa), but physical fitness and physical activity are not the same thing (22a).

[9] The health problems of low-income adolescents and racial and ethnic minority adolescents are discussed further in ch. 18, "Issues in the Delivery of Services to Selected Groups of Adolescents," in Vol. III. Also discussed in that chapter is the general paucity of data and research on low-income and racial and ethnic minority adolescents.

[10] The first edition of the NAS publication *Recommended Dietary Allowances* was published in 1943. Since then, nine revised editions have appeared, the most recent in 1989. The 1980 RDAs are similar to the 1989 RDAs, but there are some differences. In 1980, for example, the RDA for iron was 18 mg per day as opposed to 15 mg per day in 1989 (150). For a discussion of other differences, see the 1989 NAS publication *Recommended Dietary Allowances* (153).

Table 7-5—Average Daily Nutrient Intake as a Percentage of the 1980 RDAs Among U.S. Adolescents Ages 9 to 18, 1977-78[a] [b]

	Male		Female	
Nutrient	Vegetarian (N = 20)	Nonvegetarian (N = 3,462)	Vegetarian (N = 31)	Nonvegetarian (N = 3,600)
Food energy[c]	98%	86%	91%	82%
Protein	203	193	170	160
Vitamins				
Vitamin A	182	123	121	112
Thiamin	166	121	143	134
Riboflavin	171	149	118	111
Niacin[d]	150	122	118	111
Vitamin B6	123	94	81	72
Vitamin B12	191	205	142	148
Vitamin C	225	173	172	150
Minerals				
Calcium	107	97	87	74
Iron	121	91	90	76
Magnesium	97	80	115	103
Phosphorus	151	133	129	115

[a] The 1980 RDAs (150) are similar to the 1989 RDAs (153) in many respects, but there are some differences. For example, the 1980 RDA for iron was 18 mg., while the 1989 RDA for iron was 15 mg. See text for discussion.

[b] The percentages in this table are based on data from the U.S. Department of Agriculture's 1977-1978 Nationwide Food Consumption Survey (224).

[c] Recommended energy intake levels are levels to meet average needs, unlike RDAs for other nutrients, which are believed to meet the needs of the vast majority of healthy individuals.

[d] RDA is for preformed niacin rather than niacin equivalents.

SOURCE: Adapted from National Academy of Sciences, National Research Council, *Diet and Health: Implications for Reducing Chronic Disease Risk* (Washington, DC: National Academy Press, 1989). Reprinted by permission.

cents' diets, especially among females (122,142). Females' iron needs are particularly high. In addition, exercise may increase the need for iron (128), and iron deficiency during physical training is more common in females than males (see section on female adolescent athletes below).

In 1989, the NAS Food and Nutrition Board's Subcommittee on the Tenth Edition of the RDAs urged that special attention be paid to *calcium* intakes throughout childhood to age 25 to reduce the risk of osteoporosis later in life (153). However, another NAS committee, the Committee on Diet and Health, found that the evidence was not sufficient for drawing conclusions about the influence of dietary patterns on osteoporosis (152). As opposed to the effects of exercise on iron stores, exercise increases the retention of calcium in the body (23,98), as measured by the mineral content in bones; peak bone mineral density has been found to be enhanced by large calcium intakes and large energy expenditures (102).

According to data from other studies, levels of vitamin C, folic acid, thiamin, and riboflavin are low in some adolescents (47,123,191,228,231,234). Levels of manganese and copper are unknown because food composition data are incomplete (152,168). Physical activity may deplete zinc stores, but the evidence is unclear (52).

For most U.S. adolescents, vitamin and mineral deficits are subclinical and do not require professional intervention (59a). In the few cases where deficiency is commonly observed (e.g., iron deficiency in females), treatment with supplements may be necessary.

Inadequate Dietary Fiber[11]

Data on intakes of dietary fiber by U.S. adolescents are incomplete, but some observers have suggested that intakes are probably lower than recommended (2,5). On the other hand, *Healthy People 2000* noted that one expert panel (of the Life Sciences Research Office of the Federation of American Societies for Experimental Biology) indicated that levels of dietary fiber appropriate for adults may not be appropriate for children (no ages specified, and so *Healthy People 2000* did not make

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[11] *Dietary fibers* are mainly indigestible complex carbohydrates in plant cell walls and various gums, mucilages, and algal polysaccharides (153).

Box 7-D—Healthy People 2000 Objectives Pertaining to Adolescents' Physical Activity and Nutrition

Healthy People 2000 is the Nation's most prominent statement on health promotion and disease prevention objectives for the U.S. population (241). This report, published by the U.S. Department of Health and Human Services, contained a number of objectives for the year 2000 pertaining to adolescents' nutrition and physical activity and fitness. The report also provided baseline data when they were available (see below). In addition to the health status, risk reduction, services, and protection objectives listed below, *Healthy People 2000* enumerated objectives for personnel needs, surveillance and data systems, and research (241). These latter objectives were not specific to adolescents, but meeting them would be important to meeting the health status objectives for adolescents.

Nutrition Objectives for the Year 2000

Health Status and Risk Reduction Objectives

- Reduce dietary fat intake to an average of 30 percent of calories or less and average saturated fat intake to less than 10 percent of calories among people ages 2 and older (no baseline data cited for adolescents or children).
- Increase calcium intake so at least 50 percent of youth ages 12 through 24 and 50 percent of pregnant and lactating women consume three or more servings daily of foods rich in calcium (no baseline data cited for adolescents).
- Decrease salt and sodium intake so at least 65 percent of home meal preparers prepare foods without adding salt, at least 80 percent of people avoid using salt at the table (baseline: 54 percent of women aged 19 through 50 who served as the main meal preparer did not use salt in food preparation; no baseline data cited for adolescents' use of salt).

Services and Protection Objectives:

- Increase to at least 5,000 brand names[1] the availability of processed food products that are reduced in fat and saturated fat (baseline: 2,500 items reduced in fat in 1986).
- Increase to at least 90 percent the proportion of restaurants and institutional food service operations that offer identifiable low-fat, low-calorie food choices, consistent with the *Dietary Guidelines for Americans* (baseline: about 70 percent of fast food and family restaurant chains with 350 or more units had at least one low-fat, low-calorie item on their menu in 1989).
- Increase to at least 90 percent the proportion of school lunch and breakfast services and child care food services with menus that are consistent with the nutrition principles in the *Dietary Guidelines for Americans* (baseline data available in 1993).
- Increase to at least 75 percent the proportion of the Nation's schools that provide nutrition education from preschool through 12th grade, preferably as part of quality school health education (baseline data available in 1991).
- Increase to at least 75 percent the proportion of primary care providers who provide nutrition assessment and counseling and/or referral to qualified nutritionists or dietitians (baseline: physicians provided diet counseling for an estimated 40 to 50 percent of patients in 1988).[2]

Physical Activity and Fitness Objectives for the Year 2000

Health Status and Risk Reduction Objectives:

- Increase to at least 75 percent the proportion of children and adolescents aged 6 through 17 who engage in vigorous physical activity that promotes the development and maintenance of cardiorespiratory fitness 3 or more days per week for 20 or more minutes per occasion (baseline: 66 percent for youth aged 10 through 17 in 1984[3]).
- Reduce to no more than 15 percent the proportion of people aged 6 and older who engage in no leisure-time physical activity (no baseline data available for adolescents or children).
- Increase to at least 40 percent the proportion of people aged 6 and older who regularly perform physical activities that enhance and maintain muscular strength, muscular endurance, and flexibility (no baseline data available for any age group).

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[1] A brand item is defined as a particular flavor and/or size of a specific brand and is typically the consumer unit of purchase (241).

[2] This objective and the baseline data cited are not specific to adolescents. For a discussion of primary care providers' behaviors with adolescents, see ch. 15, "Major Issues in the Delivery of Primary and Comprehensive Services to Adolescents," in Vol. III.

[3] The source cited for this value was the National Children and Youth Fitness Study I.

Services and Protection Objectives:

- Increase to at least 50 percent the proportion of children and adolescents in 1st through 12th grade who participate in daily school physical education (baseline: 36 percent in 1984-86).
- Increase to at least 50 percent the proportion of school physical education class time that students spend being physically active, preferably engaged in lifetime physical activities (baseline: students spent an estimated 27 percent of class time being physically active in 1983).
- Increase to at least 50 percent the proportion of primary care providers who routinely assess and counsel their patients regarding the frequency, duration, type, and intensity of each patient's physical activity practices (baseline: physicians provided exercise counseling for about 30 percent of sedentary patients in 1988).
- Increase community availability and accessibility of physical activity and fitness facilities.[4]

Combination Nutrition and Physical Activity and Fitness Objectives for the Year 2000

Health Status and Risk Reduction Objectives:

- Reduce overweight to a prevalence of no more than 15 percent among adolescents ages 12 through 19 (baseline: 15 percent for adolescents ages 12 through 19 in 1976-80).[5]
- Increase to at least 50 percent the proportion of overweight people aged 12 and older who have adopted sound dietary practices combined with regular physical activity to attain an appropriate body weight (no baseline provided for adolescents).

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[4] These recommendations were not adolescent-specific.

[5] The values used for adolescents were "the gender-specific 85th percentile values of the 1976-80 National Health and Nutrition Examination Survey (NHANES II) corrected for sample variation" (241).

SOURCE: U.S. Department of Health and Human Services, Public Health Service, Office of the Assistant Secretary for Health, *Healthy People 2000: National Health Promotion and Disease Prevention Objectives*, DHHS Pub. No. (PHS)91-50213 (Washington, DC: U.S. Government Printing Office, 1991).

recommendations on dietary fiber for children or adolescents (box 7-D) (241).

Excessive Consumption of Fat, Cholesterol, Sodium, and Low-Nutrient Density Foods

The diets of most U.S. adolescents in national surveys fail to meet the recommendations of the NAS report *Diet and Health* (see box 7-C) because they are excessive in total fat, saturated fat, cholesterol, and sodium (46,64,111,153,159,189).

It is not surprising to find that adolescents' diets are high in fat and cholesterol. NAS reports that food patterns have changed significantly in the United States (152). Between 1909 and 1985 the percentage of calories available in the food supply from fats increased from 32 to 43 percent (152). NAS recommended that children over 2 years old should consume no more than 30 percent of calories in fat. Recent studies have found that school meals are often very high in fat (37,70,164). Fast-food meals or snacks consumed by adolescents are often high in total and saturated fat, cholesterol, sodium, and sugar (135). Table 7-6 shows the nutritional values of seven sample fast-food meals.

Approximately 25 percent of total calories consumed by U.S. adolescents, almost regardless of

Photo credit: Benjamin Smith

Current data on the food consumption patterns and nutritional status of U.S. adolescents, especially subgroups of adolescents such as racial and ethnic minorities and low-income adolescents, are limited. The most recent comprehensive information about what U.S. adolescents eat is from 1977-78. These data suggest that adolescents' diets contain sufficient amounts of most essential vitamins and minerals and more than enough protein, but not enough total calories, vitamin B6, iron, and calcium. But more recent information suggests that adolescents' diets may be too high in fat, cholesterol, and sodium.

income, sex, or race (142), come from high calorie foods that are relatively low in protein, vitamins, and minerals ("low nutrient density" foods). Snacking, or foods consumed "outside of traditional meals," provides 20 to 35 percent of adolescents' total energy intakes (46,145,224), but several studies show that the nutrient density is usually lower for snacks than for meals (57). Because recent data are not available, and data from the late 1970s suggest that adolescents generally consume sufficient proteins, vitamins, and minerals (with the exception of vitamin B6, calcium, and iron) (see table 7-5), it is not clear how much of a nutritional problem—beyond fat intake—snacking represents.

Low Levels of Physical Activity

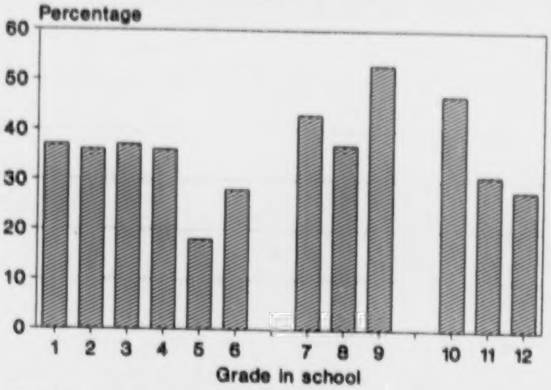
Like their nutritional needs, the physical abilities of adolescents differ from those of younger children. The changes that occur with puberty involve not only increased linear growth and mass but also physiological changes that improve physical and athletic ability. The onset of puberty is associated with an increase in aerobic and anaerobic power (97) and tolerance of exercise in the heat (13) and in the cold (202).

As noted above, there is considerable concern about levels of physical activity among U.S. adolescents on average (91a,174a,241). Detailed, accurate studies have not been carried out to show trends in activity patterns or the effects of age on activity during adolescence, but low levels of physical activity throughout adolescence have been discerned from recent surveys and semiquantitative measures of fitness (173,182).

Enrollment and participation in daily physical education classes decrease somewhat in late adolescence. Figure 7-1, based on results from the National Children and Youth Fitness Studies,[12] shows the percentage of U.S. students in 1st through 12th grades enrolled in daily physical education classes in 1984-86 (182,183, 241). Only about 20 percent of the time is spent in moderate or vigorous activity during a class (15).

Results from the National Children and Youth Fitness Studies indicate that 59 percent of 5th to 12th graders reported engaging in appropriate physical activity year round (182).[13] Of the time these adolescents spent in physical activity outside of school physical education classes (84 percent of their average weekly minutes of participation in physical activities), nearly 47 percent of students reported engaging in appropriate activities that could be carried over into adulthood (182).

Figure 7-1—Percentage of U.S. Students in 1st Through 12th Grade Receiving Daily Physical Education, 1984-86



SOURCE: U.S. Department of Health and Human Services, Public Health Service, Office of the Assistant Secretary for Health, *Healthy People 2000: National Health Promotion and Disease Prevention Objectives*, DHHS Pub. No. (PHS)91-50213 (Washington, DC: U.S. Government Printing Office, 1991), based on the National Children and Youth Fitness Study I (students in 5th through 12th grade) and the National Children and Youth Fitness Study II (students in 1st through 4th grade).

Results from the National Children and Youth Fitness Studies also indicate that U.S. children and adolescents' physical fitness is related to their mothers' physical activity and inversely to the amount of time children watch television (182). Studies of adults show that adult women of lower socioeconomic status engage in less fitness-related activity than women of higher socioeconomic status (68), and that exercise levels are similar among members of the same family (63). Taken together, these observations suggest that low-income adolescents may be less likely to be engaging in fitness-related activities. Lower participation by lower socioeconomic status individuals may be more a matter of opportunity than inclination; thus, schools could play an important role in providing occasions

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[12] The National Children and Youth Fitness Studies (NCYFS) were surveys of 5th to 12th grade students (NCYFS I) and 1st through 4th grade students (NCYFS II) (182,183,241).

[13] *Appropriate physical activity* was defined in this survey as physical activity involving large muscle groups at an intensity requiring 60 percent or greater of an individual's cardiovascular capacity engaged in at least three times per week for at least 20 minutes.

Table 7-6—Nutritional Values of Seven Sample Fast-Food Meals[a]

Meal No.	Sample meal	Calories	Total fat (g)	Percent of calories from fat (%)	Approx. tsp of fat[b]	Cholesterol (mg)	Sodium (mg)	Vitamin A IU	Vitamin C IU	Calcium (mg)	Percentage of RDA Vitamin A	Percentage of RDA Vitamin C	Percentage of RDA Calcium
1	Double burger with sauce	625	40	58		105	880	550	7	255			
	Milkshake	410	10	22		35	190	425	3	375			
	French fries (regular size)	240	15	56		15	120	15	8	10			
	Total	**1,275**	**65**	**46**	**14½**	**155**	**1,190**	**990**	**18**	**640**	**10**	**30**	**80**
2	Chicken nuggets (6)	310	20	58		70	700	100	2	15			
	Apple pie	280	15	48		5	400	15	10	15			
	Coffee with cream	65	5	69		20	15	55	—	40			
	Total	**655**	**40**	**55**	**9**	**95**	**1,115**	**170**	**12**	**70**	**2**	**20**	**9**
3	Fish sandwich with cheese and tartar sauce	495	25	45		60	676	145	4	140			
	Soda (12 oz)	150	0	0		—	15	—	—	—			
	French fries	240	15	56		13	120	15	8	10			
	Total	**885**	**40**	**53**	**9**	**73**	**881**	**160**	**12**	**150**	**2**	**20**	**19**
4	Beef tacos (2)	390	20	46		50	565	915	—	190			
	Low-fat milk (8 oz)	105	2	17		10	125	500	2	300			
	Total	**495**	**22**	**40**	**5**	**60**	**690**	**1,415**	**2**	**490**	**18**	**3**	**61**
5	Single burger	290	13	40		45	435	140	3	60			
	Tossed salad with low-calorie dressing	50	1	18		—	445	1,590	40	40			
	Low-fat milk	105	2	17		10	125	500	2	300			
	Total	**445**	**16**	**32**	**3½**	**55**	**1,005**	**2,230**	**45**	**400**	**28**	**75**	**50**
6	Baked potato (plain)	150	Tr[c]		0		0	5	—	30	20		
	Margarine (1 pat)	35	4	100		0	45	155	0	—			
	Tossed salad with low-calorie dressing	50	1	18		—	445	1,590	40	40			
	Low-fat milk	105	2	17		10	125	500	2	300			
	Total	**340**	**7**	**18**	**1½**	**10**	**620**	**2,245**	**72**	**360**	**28**	**120**	**45**
7	Cheese pizza (1 slice)	155	5	29		20	455	410	5	145			
	Tossed salad with low-calorie dressing	50	1	18		—	445	1,590	40	40			
	Orange juice (8 oz)	110	0	0		0	0	195	95	20			
	Total	**315**	**6**	**17**	**1½**	**20**	**900**	**2,195**	**140**	**205**	**27**	**233**	**26**

[a] Figures shown represent the average nutrient values for similar items of more chains. The nutrient analyses are those of Young et al. (258). The average values as listed may deviate slightly from values published as chain-specific. However, the average values as calculated appear to be fairly representative of what all chains provide.

[b] One teaspoon of fat is equivalent to approximately 4.5g of fat.

[c] Tr denotes trace.

SOURCE: Massachusetts Medical Society, Committee on Nutrition, "Sounding Board: Fast Food Fare: Consumer Guidelines," *New England Journal of Medicine* 321(11):752-756, 1989. Reprinted by permission.

for exercise by lower socioeconomic status adolescents.

A recent study of the effects of television on children and adolescents shows that adolescents spend many hours outside of school watching television—an average of 23 hours per week from 1976 to 1980 (86). Watching television may affect the amount of time adolescents spend engaging in physical activities.[14]

Obesity or Overweight

Depending on the measurement used, the prevalence of overweight and obesity in U.S. adolescents ranges from 15 to 22 percent (86,241).[15] Obesity may have genetic origins (26,31,208), but it is also associated with diet and physical activity. The family environment and the community are important in explaining obesity in children and adolescents (166). Family involvement in active lifestyles and moderation in eating patterns is usually critical in preventing and avoiding obesity. Children in obese families expend less energy than those in lean families, possibly because they copy sedentary family lifestyles (10). Obese adolescents have lower than usual levels of physical activity (21), and even when obese adolescents are physically active, they are less so than their leaner peers (30).

Obesity in adolescents may be associated with other factors, such as socioeconomic status, rate of biological maturity, or race. Fatness and sedentary habits are more common in adults of lower socioeconomic status (78). Early maturing females tend to be fatter and are more likely to become obese as adults (79). Black female adolescents appear to be overweight more often than white female adolescents (116,117,233). However, this information may be confounded in part when considering that black body composition during adolescence differs from whites; black individuals have a higher bone and muscle mass so that overweight may not always mean overfatness at levels of moderate overweight. The risk of early obesity in Mexican American adolescents, especially for the central or trunkal type of obesity (highly associated with heart disease and diabetes mellitus), is extremely high (117,236).[16] Obesity is prevalent in some American Indian tribes (20a,152), but data on obesity in American Indian adolescents are very limited (20a).

Conclusions that many adolescents are overweight—and that fatness may be increasing among adolescents (53,54,55,87)[17]—may seem inconsistent with findings that U.S. adolescents' energy intakes are, on average, lower than recommended. It may be that U.S. adolescents are more sedentary than is assumed by NAS when formulating its recommended energy allowances.

Conclusions

Current national data on the food consumption patterns of U.S. adolescents are limited. Available evidence suggests that many U.S. adolescents do not follow the general dietary guidelines set forth in publications such as the NAS report *Diet and Health: Implications for Reducing Chronic Disease Risk* (152) or in USDA and DHHS' *Nutrition and Your Health: Dietary Guidelines for Americans* (227) (see box 7-B). Specifically, it appears that U.S. adolescents tend to consume excessive amounts of fat, saturated fat, cholesterol, sodium, and foods with low nutrient density. Recent studies have found school meals to be very high in fat.

Available evidence from the late 1970s suggests that while U.S. adolescents' diets generally provide enough protein, they tend to be deficient in some specific nutrients (e.g., iron, calcium, and vitamin B6) (152). This same source suggests, however, that, on average, U.S. adolescents consume more than sufficient amounts of other vitamins, minerals, and protein. Data on average nutrition in contemporary U.S. adolescents will become available in the mid-1990s, but smaller regional studies are needed to determine nutritional deficiencies in some groups of adolescents.

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[14] See ch. 4, ''Schools and Discretionary Time,'' in this volume for a discussion of what adolescents do during their time away from school.

[15] As noted earlier, obesity and overweight can be defined in different ways. *Obesity* can be defined as BMI greater than or equal to the 95th percentile of a similar population group (usually by age); or it can be defined as 20 percent or more over ''normal'' weight. *Overweight* can be defined as BMI greater than or equal to the 85th percentile of a similar population group. Measuring triceps skinfolds is another method of measuring obesity. A matter of contention, the method used to measure the ratio of body fat *does* affect prevalence and incidence rates of obesity in a population (86,91,132,241). Because of the rate of physiological change and consequent effect on fat distribution patterns during childhood and adolescence, some measures may not accurately reflect body fat in adolescents. Also, some studies refer to ''obese'' and ''superobese'' rather than ''overweight'' and ''obese'' adolescents (86).

[16] These data have not been corrected for socioeconomic status levels; however, certain groups of Hispanics experience relatively high levels of poverty. For further discussion, see ch. 18 ''Issues in the Delivery of Services to Selected Groups of Adolescents,'' in Vol. III.

[17] However, another study which used the same data set as many of these studies but different methods for measuring the amount of body fat did not show any secular increases in BMI in adolescents (91). Inconsistent conclusions may be due to the different indices of obesity employed, and differences in age distributions and sample designs. However, no study suggests that the prevalence of obesity is decreasing among adolescents (142).

Physical activity levels of most adolescents decline throughout adolescence. The best opportunity for physical activity for some adolescents, particularly low socioeconomic status adolescents, may be during school hours. But physical education classes during school currently provide little opportunity for actual physical activity.

Available evidence suggests that from 15 to 22 percent of U.S. adolescents are overweight or obese (86,241). Diets high in fats and low levels of physical activity are factors, in conjunction with the family environment and, possibly, genetic factors. Low-income adolescents and adolescents in some racial or ethnic groups are more likely to be overweight or obese than others.

Consequences of Adolescent Nutrition and Fitness Problems

Malnutrition, low levels of physical activity, obesity, and other nutrition and fitness problems experienced by U.S. adolescents have immediate consequences (e.g., failure to grow, decreased resistance to disease, lack of energy, obesity) and may also have long-term consequences. This section reviews evidence for both the immediate and long-term consequences of nutrition and fitness problems during adolescence.

Immediate Consequences of Nutritional and Fitness Problems During Adolescence

Immediate Consequences of Nutritional Problems—The biological functions of selected dietary substances in humans were reviewed in box 7-B earlier in this chapter. Insufficient caloric intake can lead to death by starvation and insufficient intake of vitamins and minerals can lead to diseases such as scurvy or pellagra. Fortunately, starvation and diseases caused by vitamin and mineral deficiencies are rare in this country (226).

Adolescents whose *caloric intakes* are too high may experience weight gain, leading to overweight or obesity. Those whose caloric intakes are low may experience weakness, weight loss, physical inactivity, and less than optimal growth (186).[18] Excessive leanness is associated with health problems and premature death. Meal skipping is associated with lower intakes of several nutrients on a daily basis. Recent data suggest that 5 percent of U.S. adolescents, especially females, are chronic meal skippers (142). This finding may be cause for concern because low calorie diets (e.g., under 1,800 calories) may make it difficult to meet intake standards for some essential nutrients, such as iron and calcium, without supplementation.[19]

As noted in box 7-B, *iron* deficiency may result in anemia, causing decreased physical ability, impaired body temperature regulation, lowered resistance to infection, and alterations in behavior and intellectual performance (49). *Calcium* intake and absorption are necessary for adequate bone growth during adolescence (152). *Zinc* deficiency has not been found to impair the capacity for aerobic exercise in animals (128), but strength may be affected (114).

Immediate Consequences of Low Levels of Physical Activity—During adolescence, physical activity can influence growth and development of skeletal bone, muscle, and fat (142). Health values of childhood physical activity include relationships to obesity (see below) and to physical fitness and functional capacity (196). In adults, participation in high-intensity aerobic exercise has been shown to improve self-concept (130) and this may also be true for adolescents.

Immediate Consequences of Obesity—Obesity has immediate and delayed effects on social development and health (100,142). Poor body image and a decreased sense of personal worth are common among obese adolescents, especially if obesity dates from childhood (34,59,175). Obesity further encourages the tendency towards physical inactivity (10,142) and is associated with an increased risk of hypertension and high blood cholesterol (see below) (20,54, 71,85,180,246).

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[18] Adolescents with the eating disorders anorexia nervosa and bulimia (discussed below) experience weight loss and other problems that pose severe threats to their health.

[19] In 1989, the NAS Food and Nutrition Board recommended that individuals eat diets composed of a variety of foods rather than rely on supplementation or fortification (153).

Risk of Chronic Diseases Later in Life

Some nutritional and fitness behaviors during adolescence, though not immediately threatening to the adolescent population, may be associated with chronic diseases later in life.

In a recent comprehensive review of the effects of diet on health, an NAS committee drew the following conclusion:

> A comprehensive review of the epidemiologic, clinical, and laboratory evidence indicates that diet influences the risk of several major chronic diseases. The evidence is very strong for atherosclerotic cardiovascular diseases and hypertension and is highly suggestive for certain forms of cancer (especially cancers of the esophagus, stomach, large bowel, breast, lung, and prostate). Furthermore, certain dietary patterns predispose to dental caries and chronic liver disease, and a positive energy balance produces obesity and increases the risk of non-insulin-dependent diabetes mellitus. However, the evidence is not sufficient for drawing conclusions about the influence of dietary patterns on osteoporosis and chronic renal disease (152).

The NAS committee also cautioned as follows, however:

> Most chronic diseases in which nutritional factors play a role also have genetic and other environmental determinants, but not all the environmental risk factors have been clearly characterized and susceptible genotypes usually have not been identified. Furthermore, the mechanisms of genetic and environmental interactions involved in disease are not fully understood. It is evident that dietary patterns are important factors in the etiology of several major chronic diseases and that dietary modifications can reduce such risks. Nevertheless, for most diseases, it is not yet possible to provide quantitative estimates of the overall risks and benefits (152).

It is important to note that the NAS committee did not specifically review the effects of adolescents' dietary patterns on health during adulthood. There is in general very little information on such effects. While more research on the impact of adolescent dietary patterns on adolescents' immediate and future health is clearly needed, the available research on diet and chronic disease suggests that adolescents might be well advised to follow prudent dietary recommendations and should receive continuing education about links between diet and health as such information becomes available.

Risk of Obesity—Though most obese adolescents do not become obese adults, it is difficult to predict (except for the most obese) who will persist in their obesity (242). It appears, however, that the risk of continued adult obesity rises the longer an adolescent remains obese (85). Continued obesity is especially likely to be associated with increased risks of later hypertension, high serum cholesterol and coronary artery disease, adult-onset diabetes mellitus, gall bladder disease, an increase in certain forms of cancer, and other medical problems (85,133, 237).

Risk of Coronary Artery Disease—Coronary artery disease in adults is highly associated with high cholesterol levels—particularly high low-density-lipoprotein (LDL) levels and low high-density-lipoprotein (HDL) levels—physical inactivity, and high blood pressure (139,206,251). The Pathobiological Determinants of Atherosclerosis in Youth (PDAY) and the Bogalusa Heart studies have recently shown that high LDL and low HDL levels in adolescence are associated with artery-narrowing plaque (139) and that high cholesterol levels may follow an adolescent into adulthood (251).

Recently, an expert panel on blood cholesterol levels in children and adolescents at the National Cholesterol Education Program of the National Institutes of Health suggested selective cholesterol screening of some children and adolescents (i.e., those who have a family history of premature cardiovascular disease or at least one parent with high blood cholesterol) (237). But in one study, the predictive value of the occurrence of high cholesterol in adolescence for high cholesterol in adulthood is questioned; of children with cholesterol concentrations exceeding the 75th percentile, 75 percent of the females as adults and 56 percent of males as adults did not qualify for intervention using the National Cholesterol Education Program criteria (118).

There is no evidence that fitness during adolescence has a direct effect on adult health, but establishing lifetime activities (e.g., walking, running, and cycling) during adolescence may encourage continued adult participation in physical activity (196). Increased physical activity in adults has been associated with an overall decreased risk of coronary heart disease (22,146,162,163,171,197).

Risk of Diabetes—Diabetes is the most common of the serious metabolic diseases (69). Type I (insulin-dependent) diabetes usually begins in adolescence. Type II (non-insulin-dependent) diabetes usually begins in middle life or beyond.

The development of Type I diabetes occurs when an environmental event (e.g., a viral infection) triggers an autoimmune reaction in a genetically susceptible individual (69).

The development of Type II diabetes is less well understood (69). The disease runs in families, however, and the typical patient is overweight. As noted above, an NAS committee concluded that a positive energy balance (i.e., too many calories) produces obesity and thus increases the risk of Type II diabetes (152).

Risk of Cancer—Excess dietary fat and low intakes of plant foods and vitamin C are the dietary factors most strongly linked to increased risk of some cancers[20] (152). Generally, increased weight relative to height is associated with increased risk of cancer (195). Caloric expenditure or some other factor associated with physical activity in recreation or employment may be associated with decreased risk of some cancers (73,76,82,245).

Risk of Osteoporosis—Begin too thin is linked with osteoporosis in women and thinness is associated with poor nutrient (e.g., calcium) intakes (226). However, the relationship of dietary calcium to osteoporosis is uncertain (152,226). It does appear, however, that higher intakes of calcium and iron by women, especially during adolescence and early adulthood can increase bone mass and delay the onset of fractures later in life. The level of bone mass achieved at skeletal maturity (generally in the mid-twenties) is a major factor modifying the risk for fractures (152).

Conclusions

The consequences of adolescents' nutrition and fitness problems may directly affect individuals during adolescence or later in life. Some adolescents experience immediate effects, such as poor bone growth due to calcium deficiency, lack of energy due to iron-deficiency anemia, impaired resistance to infection, or obesity due to a combination of genetics, diet, and sedentary behavior.

Little research has been directed toward the effects of adolescent dietary and physical activity patterns on adult chronic disease, but some evidence suggests that the ultimate consequences of a long-term pattern of poor nutrition and low levels of physical activity may be life-threatening. As a consequence, the recent consensus document, *Healthy People 2000*, made the recommendations shown in box 7-D.

Adolescents With Particular Nutritional and Fitness Problems

Some adolescents have special nutritional and fitness problems. As discussed below, adolescents who are pregnant or lactating need increased energy intakes and other nutrients. Adolescent athletes also have special nutritional needs and subsequent problems. Other adolescents with special needs include adolescents with eating disorders such as anorexia and bulimia and adolescents with serious chronic physical or mental conditions and disabilities who may have either difficulty making proper nutritional choices, decreased mobility, or decreased access to facilities that provide exercise assistance.

Pregnant Adolescents[21]

The diets of pregnant younger adolescents are often deficient in energy, calcium, and iron. Special problems with nutritional implications include gestational diabetes, pregnancy-induced hypertension, inadequate prepregnancy weight, inadequate weight gain during pregnancy, and iron-deficiency anemia (24).

Anemia during pregnancy is associated with premature delivery, low birth weight, and fetal death (80,148). The Centers for Disease Control's (CDC) 1987 Pregnancy Nutrition Surveillance System gathered hematologic data (which define anemia) on 63,709 low-income pregnant women from ages 15 to 39 (230). CDC found that the prevalence of anemia during the third trimester of pregnancy was higher in pregnant adolescents (ages 15 to 19) than in other age groups, and for all age groups, black women had a higher prevalence than white women (see figure 7-2).

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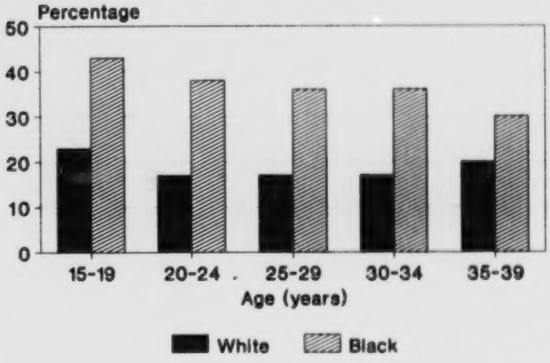
[20] Available evidence from epidemiologic and animal research suggests that a high fat intake is associated with increased risk of cancers of the colon, prostate, and breast (152). Vitamin C may protect against stomach cancer (152). NAS found the evidence for protective effects of dietary fiber inconsistent (152).

[21] For further discussion, see ch. 10, "Pregnancy and Parenting: Prevention and Services," in this volume.

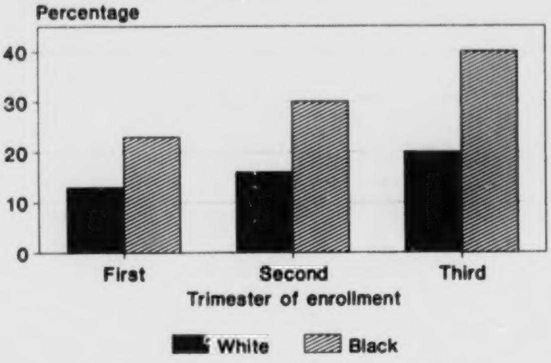
Figure 7-2—Prevalence of Anemia Among U.S. Women During the Third Trimester of Pregnancy, by Race and Age, 1987[a]



[a] Data are 1987 data from the Centers for Disease Control's Pregnancy Nutrition Surveillance System.

SOURCE: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, "Anemia During Pregnancy in Low-Income Women, United States, 1987," *Morbidity and Mortality Weekly Report* 39(5):73-76, Feb. 9, 1990.

Figure 7-3—Prevalence of Anemia Among U.S. Women During the Third Trimester of Pregnancy, by Race and Trimester of Enrollment in Public Health and Nutrition Programs, 1987[a]



[a] Data are 1987 data from the Centers for Disease Control's Pregnancy Nutrition Surveillance System.

SOURCE: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, "Anemia During Pregnancy in Low-Income Women, United States, 1987," *Morbidity and Mortality Weekly Report* 39(5):73-76, Feb. 9, 1990.

According to the CDC study, there is some evidence that participation in public nutrition programs (e.g., the Special Supplemental Food Program for Women, Infants, and Children (WIC)[22]) may improve iron nutrition status and reduce the prevalence of anemia in all age groups of low-income pregnant women (see figure 7-3). The WIC program focuses on low-income pregnant and lactating women and on children under age 5. Only 3 percent of those participating in WIC are pregnant, breastfeeding, or postpartum females under age 18.[23]

Adolescent Athletes

Participating in activities that require a certain weight or body type may in some cases lead adolescents to engage in unhealthful behaviors. For example, activities that require thinness for either aesthetic or performance purposes (e.g., wrestling, gymnastics, dance) may cause adolescents to become undernourished, bulimic, anorexic, or amenorrheic (females), and affect testosterone levels (males) (136). Activities that require greater body mass may lead adolescents to use steroids or become susceptible to fraudulent health food claims (29,66).

It is not clear to what extent coaches or physical education teachers currently work with adolescents so that they avoid unhealthful practices and obtain adequate levels of essential energy and nutrients.

Female Athletes—Female athletes may become amenorrheic, which can be detrimental to bone health; consequently these females can experience a higher prevalence of scoliosis (249) and stress fractures (17,121). They are also inclined toward vegetarianism (201), resulting in weight loss, and excessively low-fat fiber-rich diets which increase fecal loss of estrogens and reduce circulating estrogens (84,94). The quality of their diet itself could help induce amenorrhea by altering reproductive hormone levels. Female athletes, more than males, are also likely to be iron deficient (158,178).

Male Athletes—Surveys of adolescents attending high school show an increasing consumption of illegal anabolic steroids[24] to increase muscle mass and strength for athletic competition (29). The use of anabolic steroids in adult strength-trained athletes affects blood lipid profiles; there is a 55-percent decline in HDL-cholesterol and a 25-percent in-

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[22] See the section below on Federal programs pertaining to adolescent nutrition and fitness for a discussion of other Federal nutrition programs. Also see ch. 10, "Pregnancy and Parenting: Prevention and Services," in this volume for discussion of Federal programs available to pregnant adolescents.

[23] See ch. 19, "The Role of Federal Agencies in Adolescent Health," in Vol. III for more discussion of Federal agencies' emphasis on adolescents.

[24] The Anti-Drug Abuse Act of 1988 (Public Law 100-690) made unapproved use of anabolic steroids illegal.

Photo credit: Katherine Criss

Participating in activities that require a certain weight or body type may in some cases lead adolescents to engage in unhealthful behaviors such as having diets that are too low in essential nutrients.

crease in total cholesterol, indicating a possible higher risk for cardiovascular disease (95,250). These drugs also impair the metabolism of glucose (41,83) and favor net accretion of body protein, especially as muscle mass (66). Immediate effects such as acne, baldness, reduced libido, breast growth, impaired sexual function (257), and affective and psychotic symptoms (170) may present more persuasive arguments against their use by adolescent males as opposed to the more long-term effects such as cardiovascular disease.

Adolescents have much higher rates of sports injuries than younger children (75,179).[25] Older adolescents (ages 16 to 19) experience more sports injuries requiring treatment than do other age groups (50). Overall, according to one survey of adolescents, males experience the most (almost 75 percent) sports-related injuries (129). Females, however, experience more injuries related to specific activities and sports than males participating in the same activity or sport at a similar rate (9,169). According to Bar-Or, adolescent athletes and their coaches should be warned of the risk for low bone mineral stores (irrespective of calcium intake), fractures, and hypothermia or hyperthermia while exercising in cold or hot temperatures (16). The American Academy of Pediatrics Committee on Sports Medicine and Committee on School Health recommends that all coaches should be certified (4). Only 16 percent of high schools nationwide have a certified athletic trainer or comparable professional on staff (42).

Adolescents With Eating Disorders

Two serious eating disorders that afflict U.S. adolescents are anorexia nervosa and bulimia. Anorexia nervosa is a mental disorder characterized by an intense fear of becoming obese and a refusal to eat, leading to a significant weight loss (at least 25 percent of body weight) (6). Bulimia is a mental disorder characterized by a compulsion to binge and then purge the body by self-induced vomiting or use of laxatives (6). Adolescents with bulimia, most of whom are females, may experience weight fluctuations of more than 10 pounds.

Anorexia nervosa and bulimia present serious threats to adolescents' physical health, including dehydration, hormonal imbalance, and depletion of important minerals (11,25,77,92,99,106,112). Without treatment, including psychological counseling, medical treatment, and dietetic advice, some adolescents with anorexia may die. Bulimia can have serious consequences for adolescents' later physical development.

One recent survey suggests that the prevalence of anorexia among U.S. females ages 15 to 19 is 0.5 percent (126). The prevalence of bulimia in the U.S. population is estimated to be 2 percent (143). Adolescents with anorexia nervosa or bulimia need psychological counseling and medical treatment. Adults who teach, coach, or train adolescents should recognize signs of the eating disorders in their charges and refer those at risk for treatment. Student health services in schools should similarly be able to assist students with these problems.

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[25] See ch. 5, "Accidental Injuries: Prevention and Services," in this volume.

Table 7-7—Examples of Chronic Diseases and Conditions With Nutrition and Fitness Implications Among U.S. Children Ages 0 to 20, 1980

Disorder	Prevalence per 1,000 children ages 0 to 20 years	Nutrition and fitness implications
Arthritis	2.20	Feeding difficulties, obesity, diet-drug interactions, mobility inhibited, possibly altered growth
Asthma	38.00	Mobility may be inhibited
Central nervous system injury	2.15	Feeding and mobility difficulties
Cerebral palsy	2.50	Feeding and mobility difficulties
Chronic renal failure	0.08	Therapeutic diets required, wasting and delayed growth common
Cleft lip or palate	1.50	Feeding difficulties if not repaired
Congenital heart disease	7.00	Therapeutic diets may be required if severe, mobility affected, diet-drug interactions, growth retardation
Cystic fibrosis	0.20	Therapeutic diets needed, diet-drug interactions, growth retardation
Diabetes mellitus	1.80	Therapeutic diets needed, diet-drug interactions, possible growth retardation, exercise must be planned.
Down's syndrome	1.10	Feeding difficulties if severe, obesity, growth retardation
Leukemia	0.11	Anorexia at some stages, diet-drug interactions, growth retardation
Mental retardation	25.00	Feeding difficulties if severe, obesity, emaciation, growth retardation
Muscular dystrophy	0.06	Special forms and routes of feeding required, diet-drug interactions, feeding and mobility difficulties, growth retardation
Spina bifida	0.40	Therapeutic diets required, obesity, mobility problems
Phenylketonuria	0.10	Therapeutic diets required, growth retardation
Blindness	0.60	Feeding difficulties, obesity, mobility problems

SOURCE: Adapted from S.L. Gortmaker and W. Sappenfield, "Chronic Childhood Disorders: Prevalence and Impact," *Pediatric Clinics of North America* 31:3-18, 1984. Reprinted by permission.

Adolescents With Chronic Conditions and Physical Disabilities

Serious chronic conditions and disabilities often have nutritional or fitness consequences for adolescents (see table 7-7).[26] Chronic conditions and disabilities that are indirectly associated with hypoactivity (abnormally low levels of activity) include massive obesity, asthma, diabetes, blindness, Down's syndrome, and mental retardation of other types (14,194,199,209).

Adolescents with disabilities that preclude walking tend to be fatter and less active than normal adolescents. Low physical activity may explain the lower aerobic ability and greater fatness found in blind adolescents (194). Although near normal aerobic fitness can be achieved, most blind adolescents lack sighted guides and adequate facilities to allow independent exercise (194). There are limited opportunities for adolescents with physical and developmental disabilities to engage in fitness-related activities, although there is considerable evidence that such activity would benefit such adolescents (160).

Nutrition counseling and interventions can help minimize or eliminate preventable causes of poor growth. Unfortunately, schools and school food services often lack technical skills or money to implement special health, food, and educational services often needed by disabled adolescents (93). The role of nutrition could be stressed in the care of disabled and chronically ill adolescents by, for example, including a nutritionist on the health care team or emphasizing nutrition in physical training programs.

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[26] See ch. 6, "Chronic Physical Illnesses: Prevention and Services," in this volume for a discussion of the difficulties faced by many adolescents with serious chronic conditions and disabilities.

Photo credit: Jill Slater

Typically, physical fitness opportunities for children and adolescents with physical disabilities are limited. These early adolescents at the Kentucky School for the Deaf belong to a soccer team.

Phenylketonuria—Phenylketonuria is a genetic disorder of amino acid metabolism that is characterized by the inability to metabolize the amino acid phenylalanine (156,219). Although no abnormalities are apparent at birth, blood levels of phenylalanine rise rapidly after protein feedings are begun, and if diagnosis and dietary treatment is not begun within 30 days of birth, severe mental retardation will result (181).

Phenylalanine-restricted diets are known to enhance normal intellectual development in children with phenylketonuria. Studies suggest that continuation of such therapeutic diets throughout adolescence could maintain a child's intellectual achievement (38,124).

Juvenile-Onset Diabetes—As noted earlier, there are two major types of diabetes. Type I (insulin-dependent) diabetes typically has its onset in childhood or adolescence. Age 14 is the peak age for incidence of disease (69).

Insulin is required for treatment of all type I patients (69). In addition, adolescents with type I diabetes must follow a specified dietary regimen. Therapeutic diets, in conjunction with exercise and drug therapy, control some of the complications of type I diabetes (such as insulin shock, diabetic ketoacidosis, coma, and hypoglycemic reactions) (74). In adolescents, as well as adults, dietary cooperation is sometimes enhanced if the patient is occasionally allowed a special treat (e.g., a dessert ordinarily forbidden) with the understanding that resumption of the diet will begin the next day (69). Studies suggest that overweight diabetic adolescents could improve their carbohydrate metabolism by exercising regularly (144,176).

Adolescents With Mental Retardation or Developmental Disabilities

Mental retardation may be associated with secondary malnutrition, due to difficulties in feeding, or to inadequate care (12). Thus, the nutritional status of mentally retarded adolescents, living both in and outside of institutions, is of concern. According to teachers and parents, participation of mentally retarded adolescents in physical fitness programs has good psychological effects (199).

Emotionally Ill Adolescents

Some emotional disorders, or their treatments, have nutritional implications (e.g., some antidepressant drugs can affect the appetite). Nutritional guidance could be integrated into settings for mental health services provision. In adults, participation in high-intensity aerobic exercise has been shown to improve self-concept (130) and reduce depression (213). The possibility that aerobic exercise could be a beneficial addition to programs for troubled adolescents should be explored.

Conclusions

Certain populations of adolescents have special nutritional and fitness needs which may require attention by the adolescents themselves, their families, and the professionals around them. Heightened awareness of the importance of nutrition and fitness to the overall health of these adolescents (e.g., through nutrition education or physical education for the adolescents, or training programs for family and professionals) and providing opportunities to achieve nutrition and fitness goals (e.g., food programs or access to physical activity facilities) could help alleviate or prevent some problems experienced by these adolescents.

Prevention and Treatment of Nutrition and Fitness Problems

Adolescents' Nutritional Choices

The National Adolescent Student Health Survey in 1987 found that 37 percent of 8th and 10th graders ate breakfast every day (the survey period was the "previous week"), 51 percent ate lunch every day, and 68 percent ate dinner every day (7). In contrast, 16 percent *never* ate breakfast during the past week, 6 percent never ate lunch, and 1 percent never ate dinner. Females ate fewer meals in a week than males, and 10th grade females ate fewer meals than 8th grade females. The survey found that most (89 percent) of the surveyed 8th and 10th grade students who reported eating breakfast ate their breakfast at home, though some (7 percent) ate at school (7). Those who ate lunch, however, typically obtained it at school (72 percent v. 19 percent bringing lunch from home). Fewer 10th graders than 8th graders brought lunch from home (13 percent v. 19 percent) though more ate lunch someplace other than at school (13 percent v. 4 percent).

The National Adolescent Student Health Survey also showed that most 8th and 10th grade students snack (only 12 percent ate no snacks the day before), and further, that most (61 percent) of the snacks consumed were "junk food" (chips, soda, candy, ice cream, or cake) rather than nutritious snacks (fruits, vegetables, nuts, juice, milk, yogurt, or cheese) (7). Male and female snacking behaviors were about the same.

As adolescents grow older, competing demands on their interests and energy and potent social forces (including peer pressures, busy schedules, and sports concerns) rise in importance (119,125,136,198,204, 253), while the importance that adolescents attach to nutrition may decline (125). In one study, 45 percent of junior high school students felt that nutrition is "very important," as compared with 36 percent of senior high school students (125). Interestingly, nutrition decreased in importance at the same time that perceived control over nutritional choices increased. Fifty-six percent of junior high school students reported that they themselves have the most influence over what they eat, as compared with 74 percent of senior high school students (125).

Adolescents sometimes emphasize factors other than health or nutrition in making food choices (44). For example, weight was of great concern among adolescents surveyed in 1989, especially females; nearly half of all 11th and 12th grade students surveyed had been on a diet at least once, and the vast majority who had dieted did so for cosmetic rather than health reasons (125). Societal stresses on the cosmetic aspects of fitness are extreme and lead some adolescents to attempt to control weight and appear fit by restrictive (and potentially harmful) dieting (34) rather than by a combination of diet and physical activity. Increasingly, female adolescents are concerned about their weight at younger ages (113).

Influencing Adolescents' Nutritional Choices

Health Education

In 1985, only 12 States had mandated nutrition as a core content area in school health education (241). But, of the 80 percent of 8th and 10th graders surveyed in 1987 who had at least one health education class, 74 percent had received nutritional instruction in that class (7); this finding suggests that there is substantial dissemination of at least some nutrition information. In addition, community-based programs can reach targeted adolescent populations (e.g., pregnant adolescents not in school). USDA's Food and Nutrition Service has prepared nutrition advice and information, which is available for groups with special nutritional needs (222). Food and nutrition-related services in rural areas could be expanded and links with already existing services could be explored (e.g., the Cooperative Extension Service of USDA has offices in almost every county which is supported by a State office) (222). State health departments provide nutrition education materials, nutrition counseling, and nutrition consultation to targeted populations and to programs developed for them.

But increasing knowledge about proper nutrition alone does not necessarily improve eating habits. Although 67 percent of 11th and 12th grade students reported that saturated fat and cholesterol should not be eaten in excess, this knowledge had only a slight influence on consumption of foods high in these constituents (125). The manner in which the information is presented may influence its impact. For example, adolescents regard nutrition education curricula that neglect food preferences and other motivational factors as boring and irrelevant (33). Other school-based health promotion activities have been effective, however. For example, one school-based approach resulted in the short-term reduction of cardiovascular disease risk factors in 10th graders by modifying diet and exercise (110).

Marketing science experts recognize that adolescents have special wants, and they tailor appeals to the youth market to meet them (81). Appropriate motivation and modifications in the social environment help to persuade adolescents and adults to give more priority to healthful food choices when they decide what to eat (253).

Food Labels

Data from the National Adolescent Student Health Survey in 1987 suggest that adolescents in the 8th and 10th grades are able to apply basic skills in solving nutrition-related consumer problems but lack certain specialized consumer information which would permit them to make wise food choices (7). Further, only 27 percent had previously received any education or instruction during school in interpreting food labels. The current national debate on the content of food labels (108,149) highlights the importance of information in making informed nutritional choices. In addition to recommending Federal regulations regarding nutrition labeling, a recent Institute of Medicine report calls for regulations that would require fast-food restaurants to provide nutrition information to consumers (149).

Menus in Schools and Institutions

Many schools incorporate the principles of USDA and DHHS' *Dietary Guidelines for Americans* (227) in their meal planning (241). Nevertheless, it has been reported that school meals are high in fat (37,70,164). Modifying school menus appears to command some public support (216). One study successfully altered the diets of students by modifying the menu and the way foods were prepared (the polyunsaturated-to-saturated fat ratio of the diet of students who were served fat-modified diets increased significantly) (61).

Low-income adolescents in participating schools can receive breakfast and lunch at school free or at a reduced price (see section below on Federal programs). USDA prepares recipes for schools to use in planning their meals. Evaluations of these meal programs have shown that they have a positive overall effect on the nutritional intake of the participants (216), although as noted above, they may be high in fat.

Conclusions

Nutrition education, either as a component of school health education curricula or more targeted outreach programs, is available from a number of sources and most adolescents appear to receive some nutrition education, at least while they are in school. There is little information about the effect of nutrition education on adolescent dietary behaviors, though some studies show that there are effective interventions. Providing nutritional foods in meals provided by schools may provide as much benefit to adolescents as nutrition education does.

Influencing Adolescents' Physical Activity Levels

Physical Education in Schools

As noted above, students attend physical education classes in decreasing numbers throughout adolescence. Further, these classes do not provide much opportunity for physical activity (20 percent of class time) (13). The emphasis in physical education classes is on competitive sports rather than on activities and skills that can be more easily carried over to later years (e.g., swimming, tennis, and cycling) (13,196). Although there is little *adolescent specific* information on the effects of not participating in so-called "lifetime" physical activity during adolescence, there is a general consensus that adolescents could benefit from additional physical activity (e.g., 3,241).

Community Facilities for Physical Activities

Several observers have suggested that every adolescent should have access to public facilities and community programs that encourage safe, beneficial, enjoyable physical activity (177,184). Many adults believe that greater availability of exercise facilities would help them become more involved in regular exercise (241). To OTA's knowledge, adolescents have not been asked about their recreational needs or preferences. A 1986 survey of municipal and county park and recreation departments found that the average number of citizens per managed acre was well within the standards set by the National Recreation and Park Association (138). But the numbers of trails (for hiking, jogging, bicycling, or cross-country skiing), pools, tennis courts, and basketball courts per citizen are below those suggested by the National Recreation and Park Association (138), and the DHHS publication *Healthy People 2000* recommends that communities establish additional opportunities for engaging in physical activity (box 7-D) (241).

Conclusions

Opportunities for adolescents to participate safely in physical activity are hampered by the current construction of school physical education classes, the lack of certified physical education teachers and

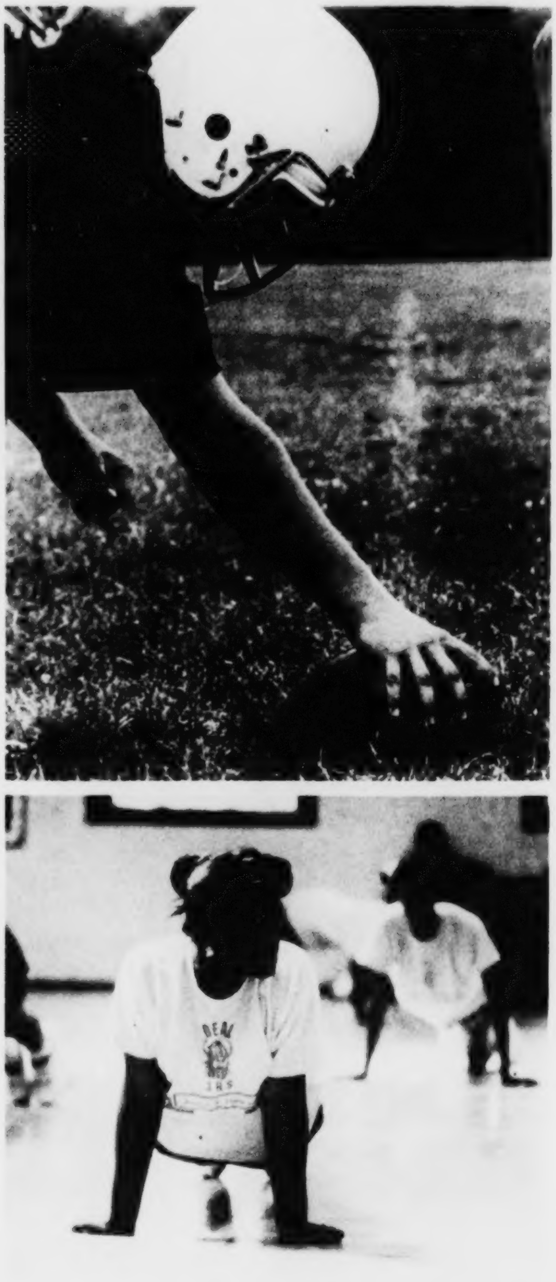

Photo credits: Education Week (top photo); Benjamin Smith (bottom photo)

Some observers concerned about adolescent health have noted that opportunities for physical activity during adolescence tend to emphasize competitive sports (top) rather than activities and skills that can be more easily carried over to later years (bottom).

coaches, and the lack of community facilities for physical activity.

Interventions To Prevent or Reduce Adolescent Obesity

The effectiveness of specific treatment interventions to help obese adolescents appears to be dependent on a multiple approach that includes diet, exercise, behavioral techniques, and the support of families, communities, or peers (93a,97a,247). Further, some interventions to prevent obesity take an environmentally based approach meant to narrow the range of adolescents' food choices (61,97a).

Powerful predictors of success in fitness and obesity control include afterschool activities of adolescents at home and in the community (165). When parents and children participate in obesity control programs together and incorporate all program elements (e.g., behavior modification practices), they can be fairly effective (28). An example of a family-based program is Shapedown, which involves behavior modification, physical activity, modest reduction in food intake, and attention to the families' and adolescents' views of themselves (141a).

Clinical treatment of obesity has been found to be effective when it includes the traditional emphasis on increased physical activity with modest decreases in energy inputs combined with behavioral techniques (62), including self-monitoring diet and exercise, control of stimuli that precede eating, and reward of desirable behaviors.

One review of various treatment schemes for pediatric obesity suggests that the most effective school-based programs include exercise, nutrition, and behavior modification (248). Five elements are important for school-based programs: physical education programs, classroom education, the school lunchroom, the school health office, and liaison with home and community programs. Obese adolescents need help in setting realistic targets for fatness and weight loss (57,59,97a). Support programs using younger and older peers, with frequent reinforcement of progress from teachers, physical education instructors, school nurses, and others are also important (207).

Major Federal Programs Related to Nutrition and Fitness

U.S. Department of Agriculture

USDA is the Federal agency with major responsibility for Federal nutritional programs, including the collection of data on topics listed in box 7-A and the provision of food services for low-income people.

USDA's Human Nutrition Information Service conducts and interprets applied research in food and nutrition. Its responsibilities include monitoring food and nutrient content of American diets, assessing dietary status and trends in food consumption, understanding food choice influences, maintaining the national nutrient data bank on the nutrient content of foods, and developing information and techniques for making informed food choices.

USDA's Food and Nutrition Service administers the Federal Food Stamp Program and Child Nutrition Programs (including National School Lunch and Breakfast Programs, the Summer Food Service Program, the Special Supplemental Food Program for Women, Infants, and Children[27] and the Child Care Food Program).

The Food Stamp Program is a program that provides low-income individuals and families with children with noncash transfers which can be used only for food. Eligibility is based on family income. The amount of the benefit for each family is calculated based on a number of family-dependent factors (e.g., work and child care expenses) and on the cost of the Thrifty Food Plan (based on an inexpensive, but nutritionally sound diet). For those participating, the program has been associated with significant improvements in dietary intake (217). But, according to USDA's 1977-78 Nationwide Food Consumption Survey,[28] only 12 percent of low-income households spending at the full food stamp allotment obtained 100 percent of their recommended dietary allowances, and only a third obtained at least 80 percent (217).

Adolescents ages 15 to 17 make up 34 percent of the participants in the Food Stamp Program, but all eligible adolescents may not benefit. In 1979, less than 60 percent of all poor households participated in the Food Stamp Program (216).

Other food programs directly affecting adolescents are the School Breakfast and School Lunch programs, which provide meals for low-income school children free or at a reduced price depending on family income. The programs have been shown to increase the amount of food consumed by participants, as a supplement for family meals rather than as a substitute (216). A 1981 USDA study found that students from families qualifying for free or reduced-price meals were dependent on the National School Lunch Program for between 34 and 49 percent of their daily nutrient intake (217).

Forty-three percent of individuals in the National School Lunch Program and 24 percent in the School Breakfast Program are adolescents ages 13 to 18, (see table 7-8). In 1983, 92 percent of all elementary and secondary schools participated in the National School Lunch Program (214), but the School Breakfast Program was available in only about a third of all schools (215). Schools that participate in the School Breakfast Program are generally located in low-income areas (215).

U.S. Department of Health and Human Services

Within DHHS, nutrition research and monitoring are principally conducted by two Public Health Service agencies: the Centers for Disease Control and the National Institutes of Health (see below). These make up the Department's major effort related to the nutrition of adolescents. Other nutrition-related services are provided to adolescents by the Bureau of Maternal and Child Health in the Health Resources and Services Administration of DHHS,[29] by the Indian Health Service, and by the Office of Human Development Services. The Office of the Assistant Secretary for Health compiles DHHS' Health Objectives for the Year 2000 (found in the recent DHHS publication, *Healthy People 2000*), which include nutrition- and physical activity-related policy objectives (box 7-D).

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[27] The Special Supplemental Food Program for Women, Infants, and Children (WIC) was mentioned in an earlier section about pregnant adolescents.

[28] Data from the 1987-88 Nationwide Food Consumption Survey were not available as of mid-1991.

[29] The Bureau of Maternal and Child Health provides nutritional support principally in the form of block grants to States for the provision of nutritional services. Also, funds for training public health nutritionists and research and program development projects are disseminated through the special programs of regional and national significance (SPRANS) program.

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Table 7-8—Participation in the National School Breakfast and National School Lunch Programs, 1983-84 School Year

	Number of students participating in the program at least once per week (thousands)	Participation rate	Number of students participating on an average day (ADP) (thousands)	Average daily participation (ADP) rate
School Breakfast Program[a]				
All students	3,609	24.2%	2,733	18.3%
Meal price status				
Free	2,564	53.9	2,107	44.3
Reduced	222	20.6	157	14.6
Full	823	9.0	469	5.1
Grade level				
1-3	1,316	31.3	1,049	25.0
4-6	1,337	31.5	1,027	24.2
7-9	614	17.4	425	12.0
10-12	342	11.6	232	7.8
School Lunch Program				
All students	30,078	77.5%	25,550	65.9%
Meal price status				
Free	9,763	96.2	9,319	91.8
Reduced	1,816	91.4	1,658	83.4
Full	18,497	69.4	14,574	54.7
Grade level				
1-3	8,327	87.9	6,916	73.0
4-6	8,535	85.0	7,644	76.1
7-9	7,373	76.0	6,230	64.2
10-12	5,841	61.0	4,761	49.7

[a] A student is a participant in the School Breakfast Program (School Lunch Program) if he or she selects one or more breakfasts (lunches) during a week. The *participation rate* is the number of participants divided by the total number of students in schools that offer the program. The number of students participating on an average day (ADP) is calculated as one-fifth the reported number of meals served in a week. The ADP rate is the ADP divided by the total number of students in schools that offer the program.

SOURCE: U.S. Department of Agriculture, Food and Nutrition Service, Office of Analysis and Evaluation, "Characteristics of the National School Lunch and School Breakfast Program Participants," Washington, DC, January 1988.

Centers for Disease Control

CDC works to promote sound nutritional habits through comprehensive school health programs. CDC's efforts include: 1) building consensus regarding priority nutrition intervention issues for the purpose of developing national guidelines; 2) collaborating with USDA to ensure that these guidelines incorporate the perspective of the Nutrition Education and Training Program and National School Lunch and Breakfast Programs; and 3) reviewing State policies relevant to nutrition intervention in schools and to school breakfast and lunch programs.

In addition, as noted earlier, CDC is developing the Youth Risk Behavior Surveillance System (YRBSS) to monitor trends in the prevalence of priority risk behaviors among youth at the national and State levels (see box 7-A). CDC also supported the 1987 National Adolescent Student Health Survey (7). The National Center for Health Statistics in CDC conducts the National Health and Nutrition Examination Survey (NHANES) and the National Health Interview Survey (NHIS) (see box 7-A), which collect nutrition and health data on adolescents.

National Institutes of Health

National Heart, Lung, and Blood Institute (NHLBI)—In April 1991, NHLBI issued the Panel Draft Report of the National Cholesterol Education Program, which called for all Americans over 2 years of age to adopt a low saturated fat, low cholesterol diet. Also, NHLBI is conducting a multicenter monitoring project to compare risk factors, such as hyperlipidemia and blood pressure, in black and white adolescent females.

National Cancer Institute (NCI)—NCI is supporting, through a collaboration between NCI and the American Cancer Society, a school-based nutrition education project to improve adolescent health. A curriculum for intermediate and secondary school students is being pilot tested in four regions. A companion manual for food service providers is also being tested as an aid in making school lunch programs consistent with USDA and DHHS' *Dietary Guidelines for Americans* (227).

Conclusions and Policy Implications

Conclusions about U.S. adolescents' nutritional and fitness status are difficult to draw for several reasons. Current national data on U.S. adolescents' nutrition and fitness are not available. Research on nutrition and on fitness is hampered by inconsistent outcome measures and other methodological problems (225).

Extrapolating from available information, OTA concludes that the most prevalent nutritional problems among today's adolescents are overweight or obesity, iron deficiency anemia, and eating disorders. Obesity is often associated with low levels of physical activity and poor self esteem. Obese adolescents may be at increased risk of heart disease, hypertension, diabetes (particularly if obesity is continued during adulthood) and certain cancers. For female adolescents, especially female athletes and females who are pregnant, iron deficiency anemia is a particular problem, because it decreases physical ability, resistance to infection, and intellectual performance. During pregnancy, anemia can also affect the health status of the fetus (low birthweight, premature delivery, and fetal death). Calcium, another mineral often deficient in adolescent diets, is important for achieving peak bone growth. Female adolescents with anorexia nervosa or bulimia are at great risk of experiencing health problems and even death.

Some evidence suggests that the diets of American adolescents are high in fat and sodium. High-fat diets can contribute to obesity in the short term, and, if such diets persist, to the occurrence of some cancers (e.g., colon and breast), coronary heart disease, and non-insulin-dependent diabetes later in life (152). Some adolescents with physical disabilities or chronic diseases (e.g., diabetes) require special attention to meet their nutritional and physical activity needs. Some diseases and medications can affect the absorption of nutrients, and sometimes, therapeutic diets can help control diseases (e.g., diabetes). The availability of special health, food, and education services in schools and school food services for these adolescents is often limited.

Photo credit: Benjamin Smith, Washington, DC

Very often, adolescents have little control over the food available to them. Congress could support efforts to provide better nutritional choices to adolescents.

U.S. adolescents' ability to make good nutritional choices and decisions about physical activity for themselves may be influenced by the information provided to adolescents (or lack of it) about the foods they eat and the effects of physical activity. Nutritional information about school menus and fast food meals may not be routinely available to adolescents (although some fast food restaurants make or plan to make nutritional information more accessible at point of purchase). Many health education classes include nutrition education as a component, but it is not clear that these classes alone significantly influence the eating habits of adolescents. Some evidence suggests that education curricula that take adolescents' preferences into account may be better received than curricula that do not. Most adolescents get breakfast and lunch from home or school, so food choices (at least for these two meals) may be dependent on whoever buys the groceries or plans the menus. There have been several calls to improve the nutritional content of school (37) and "fast food" (27a) meals.

Access to fitness-promoting activities is apparently a problem for adolescents. Enrollment in physical education classes declines somewhat during the adolescent years; in any event, school-based physical education classes appear to provide little opportunity for actual physical activity.

For adolescents in general, there is little information about the specific benefits of physical activity; for example, there is no research to suggest that physical activity during adolescence leads to continued activity as an adult. It is clear, however, that increased physical activity could help overweight adolescents reduce their weight and thereby reduce the immediate psychological consequences of obesity and the potential risk of future chronic diseases.

Specific policy options regarding adolescents' nutrition, physical activity, and physical fitness are listed in Volume I.

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Chapter 8

DENTAL AND ORAL HEALTH PROBLEMS: PREVENTION AND SERVICES

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Chapter 8

DENTAL AND ORAL HEALTH PROBLEMS: PREVENTION AND SERVICES

Introduction

For the last three decades, dentistry has emphasized population-wide public oral health measures to prevent dental caries (e.g., fluoridation of water supplies) and the treatment of dental caries[1] in younger children, assuming that early interventions would achieve the best short- and long-term effects (4). This emphasis has clearly proved successful. In the last 20 years, the prevalence of dental caries in all age groups, including adolescents ages 10 through 18, has declined dramatically (97).

As a consequence of the success of preventive measures in reducing dental caries and of dentistry's focus on the treatment of dental caries in younger children, however, many aspects of the dental and oral health of adolescents have been neglected (1). Traditionally, many dental professionals have tended to regard adolescence as a quiescent period with few dental needs, a continuation of childhood in which earlier dental intervention carried the patient to adulthood in good oral health (20). In fact, however, adolescence is a unique time, in terms of dental considerations, during which:

- dental caries rates increase from childhood (18);
- the first signs of periodontal disease[2] occur (20);
- up to a third of facial growth occurs (during a relatively short growth spurt) (34); and
- most orthodontic[3] therapy occurs.

Furthermore, the transition from childhood to consenting adulthood and responsibility for care, along with issues such as differences in dental disease patterns and care-seeking behaviors of specific groups of adolescents, and unmet dental treatment needs, make adolescence a pivotal period with respect to dental and oral health.

This chapter covers several topics pertaining to the oral health of U.S. adolescents, beginning with physiologic and anatomic changes that affect adolescents' teeth and related structures and the prevalence of major dental problems in 10- to 18-year-olds.[4] It also identifies a number of factors that are associated with adolescent dental health problems. Prevention of dental and oral health problems is addressed, along with the dental service delivery system. Finally, the Federal Government's role in oral health is discussed, and conclusions and policy implications are presented.

Background on Adolescents' Dental and Oral Health

Biological Factors That Affect Adolescents' Dental and Oral Health

Puberty is the initiation of adolescence, and several of the physical developmental changes that characterize puberty are mirrored in a person's oral cavity (mouth). From the standpoint of oral health, three types of changes during adolescence are particularly important:

- the transition from primary to permanent teeth,
- skeletal growth, and
- hormonal change.

The first few years of adolescence are a dynamic time in terms of dentition (teeth). Between the ages of 10 and 12, a person's entire set of primary teeth has been replaced with permanent successors, second or 12-year-old molars have erupted, and only the third molars remain to develop and erupt (27). By ages 12 or 13, an individual's permanent teeth are usually stable.

Skeletal growth during adolescence has implications for orthodontic treatment. The face grows significantly during adolescence, completing almost all of the vertical growth that affects tooth position, facial contour, and space available for teeth (66). Orthodontic treatment must take skeletal growth into account during this period.[5]

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[1] *Dental caries* can be defined as the localized, progressive decay of a tooth, starting on the surface and, if untreated, extending to the inner tooth chamber and resulting in infection.

[2] *Periodontal disease* is any disease of the tissue surrounding the teeth. The two most prevalent periodontal diseases are *gingivitis* (inflammation confined to the gums) and *periodontitis* (inflammation of both the gum and the other supporting structures of the teeth).

[3] *Orthodontics* is the area of dentistry concerned with the bite and how teeth mesh together.

[4] For the purpose of this Report, OTA has focused on adolescents ages 10 through 18. Data pertaining to dental health are not readily available for this age group. For that reason, some of the data cited in this chapter do not conform precisely to this age grouping.

Hormonal changes seem to affect the susceptibility of adolescents to gingival problems (74) (e.g., because hormones interact with local irritating factors such as plaque and calculus[6]). Like other aspects of adolescents' dental health, however, the relationship between hormonal changes and gingival problems is poorly understood.

Trends in the Incidence and Prevalence of Adolescents' Dental and Oral Health Problems

The major dental diseases and conditions affecting adolescents (indeed, all age groups) are dental caries, periodontal disease, and malocclusion. These three problems and various indexes used to measure the extent of these problems are discussed in box 8-A.

Over the last three decades, adolescents have experienced some dramatic changes in dental disease patterns—the most impressive of which is the drop in prevalence of dental caries during the last 20 years.[7] Malocclusion has also undergone a transition in recent decades, from a condition caused to a significant degree by premature tooth loss due to dental caries and subsequent crowding of teeth to a condition that is largely inherited (1a).

Dental Caries

For most U.S. adolescents, the situation with respect to dental caries seems to have changed significantly for the better in recent years. Data collected among U.S. school children by the National Institute of Dental Research (NIDR) in the U.S. Department of Health and Human Services (DHHS) suggest that the prevalence of dental caries as measured by the DMFS index[8] has been diminishing among 10- to 17-year-olds (see figure 8-1). Also, they suggest that the percentage of caries-free adolescents has been increasing (see figure 8-1).

Although the prevalence of dental caries still remains higher among adolescents than among younger children, data from the NIDR surveys shown in figure 8-2 indicate that 10- to 17-year-old school children in this country experienced a 20- to 40-percent decline in the prevalence of dental caries from 1980 to 1987 (97).

The data from the NIDR surveys of U.S. school children conducted in 1979-80 and 1986-87 suggest that dental caries of permanent teeth is slowly, but consistently, decreasing in the U.S. adolescent population as a whole. Despite the overall improvements, however, it is important to note that dental caries remains a significant dental problem for certain groups of adolescents.[9]

Figure 8-3 shows data from the NIDR surveys that compare white and nonwhite adolescents with respect to the distribution of components of age-specific mean DMFT scores.[10] [11] In both surveys, the D component of the DMFT index (decayed teeth) accounted for a higher percentage of age-specific mean DMFT among nonwhite adolescents than among white adolescents. This means that nonwhite adolescents had a higher percentage of untreated caries than white adolescents. The M component of the DMFT index (missing teeth) accounted for a larger and far more rapidly increasing percentage of mean DMFT among nonwhite adolescents ages 10

---

[5] Unfortunately, no precise predictor of facial growth exists, and while such growth can be tracked and extremes identified, the development of useful tools to help plot an adolescent's final orthodontic status remains elusive (19).

[6] *Plaque* is a soft deposit of bacteria and other materials on the surface of a tooth. *Calculus* is a hard deposit of calcium phosphate and carbonate with organic matter on the surfaces of the teeth.

[7] The main data sources OTA used to describe trends in the prevalence of dental caries in adolescents are national surveys of school children performed by or for the Federal Government—e.g., National Institute of Dental Research: *National Caries Program, The Prevalence of Dental Caries in United States School Children, 1979-80* and *Oral Health of U.S. Children: The National Survey of Dental Caries in U.S. School Children, 1986-87* (94,97). These data sources have limitations described in box 8-B. One of the primary limitations is that national survey data do not adequately portray the caries experience of particular subgroups of adolescents with unique circumstances or risks, such as poor or disabled adolescents or adolescents who do not attend school.

[8] The *DMFS index* and the *DMFT index* are used to measure the prevalence of dental caries and are described in box 8-A.

[9] See the following section on "Factors Associated With Adolescents' Dental and Oral Health Problems."

[10] The DMFT index is described in box 8-A.

[11] These survey data differentiate only between white and nonwhite populations. See box 8-B for further discussion of the limitations of Federal sources of data on dental and oral health.

Box 8-A—Overview of Three Dental Problems: Dental Caries, Periodontal Disease, and Malocclusion

Three major dental diseases and conditions affect adolescents: dental caries, periodontal disease, and malocclusion. These problems, and indexes commonly used to measure the prevalence or other aspects of these problems, are described below.

Dental Caries—Dental caries is the localized, progressive decay of a tooth, beginning on the tooth's outer enamel surface and, if left untreated, extending to the inner tooth chamber. Dental caries is a condition to which individuals of all age groups and races are susceptible, but the rate of dental caries is highest among adolescents (1).

Far more is known today about dental caries than even a decade ago. Basically, dental caries is an infectious condition that requires a combination of a susceptible host, cariogenic bacteria, and a diet high in carbohydrates; over an extended period of time (usually at least several months), the acid produced by bacterial metabolism leads to the decalcification of the tooth.

One especially virulent form of caries that affects a small portion of adolescents is *rampant caries*. Rampant caries involves extensive breakdown of enamel and dentin, and pulpal pathosis. It devastates the dentition and creates pain. This rapidly progressing condition can occur in individuals with or without a significant history of dental caries. Not all patients who experience high caries activity experience rampant caries, but the destruction of rampant caries puts those patients with the condition in the high caries activity group.

The DMFT and DMFS Indexes: Two indexes are commonly used to measure the prevalence of dental caries. One of these, the DMFT index, measures the average number per person in a specified population of Decayed permanent teeth in need of a filling or extraction, Missing permanent teeth that have been removed as a result of caries, and Filled permanent teeth. The other index, the DMFS index, measures the average number per person in a specified population of Decayed permanent tooth surfaces, Missing permanent teeth, and Filled (or restored) Surfaces of permanent Teeth. The DMFS index is a somewhat more sensitive measure of the prevalence of dental caries, because it identifies caries on several sites of each tooth. The technique of examination for the both the DMFS and the DMFT index is described in a variety of references (79,97). Sometimes, the separate components of the DMFT or DMFS index are used as a measure of service utilization (e.g., the F component is an indication of dental treatment of decayed teeth, and the M component may suggest what type of dental care has or has not been received (i.e., a high M component suggests that teeth were extracted as a result of untreated decay).

Treatment: The treatment for dental caries varies, depending on the condition's severity. Although dental caries in its mildest form affects only the tooth's enamel and causes lesions that may not require treatment, dental caries that progresses beyond the tooth's enamel to the inner tooth may cause lesions that necessitate a filling or dental restoration, pulpal[1] therapy, or even removal of the tooth. The focus in this chapter is on carious lesions requiring treatment.

Periodontal Disease—Periodontal disease includes several diseases of the tissue surrounding and supporting the teeth (76). The two most prevalent periodontal diseases are gingivitis and periodontitis. *Gingivitis*, by far the most common, is inflammation of the gingiva (gum) only; and is by itself relatively innocuous. *Periodontitis* is inflammation of both the gums and other supporting structures of the teeth (e.g., the outer bone of the tooth socket, the outer layer of the root of the tooth, and the soft tissues that attach these structures to one another). Unlike gingivitis, periodontitis is associated with the destruction or loss of the supporting structures of the teeth. Periodontitis does not develop in the absence of gingivitis, but gingivitis does not always lead to periodontitis. Bacterial infection is an essential factor in both gingivitis and periodontitis (76).

Periodontal disease is more common and more severe among adults than among adolescents. Periodontal problems are generally fewer and less severe than dental caries problems among adolescents, rarely leading to tooth loss during this age period. Nevertheless, adolescents are affected by a variety of acute and chronic periodontal problems, ranging from mild gingivitis to frank periodontal disease. One chronic periodontal condition peculiar to adolescence is *localized juvenile periodontitis*, which causes the loss of alveolar bone supporting permanent teeth and the weakening of the dentition. Thought to be caused by the organism *Haemophilus (Actinobacillus) actinomycetemcomitans*, or a combination of organisms, localized juvenile periodontitis is insidious and is not necessarily present with inflammation as is gingival disease. It occurs in a small percentage of adolescents,

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[1] Dental pulp is the soft sensitive tissue that fills the chamber of the tooth.

Continued on next page

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Box 8-A—Overview of Three Dental Problems: Dental Caries, Periodontal Disease, and Malocclusion—Continued

usually early on. The superficial gingival tissue of a person with localized juvenile periodontitis can appear normal, so the condition is often missed or diagnosed late in its course.

The Simplified Oral Hygiene Index (OHI-S): The OHI-S is a measure of oral cleanliness and plaque control, with a low score denoting good oral hygiene. Good oral hygiene can improve periodontal health (76).

Periodontal Health Measures: The periodontal health of 14- to 17-year-old school children in 1986-87 was assessed using two measures—gingival bleeding upon probing and periodontal attachment loss (11,12,97). Bleeding gums are generally the result of mild gingivitis. Periodontal attachment loss is a measurement of periodontal destruction—the loss or destruction of the supporting structures results in the formation of pathologic spaces or pockets around the teeth. These pockets are measured in millimeters using a ''periodontal probe'' (97).

Treatment: Uncomplicated gingivitis is usually easy to treat with nonsurgical methods such as plaque removal (76). Daily plaque removal is considered optimally conducive to gingival health. The treatment of more serious periodontal disease may involve periodontal surgery or nonsurgical methods such as the ''Keyes technique'' (76).

Malocclusion—Malocclusion is the malpositioning of maxillary (upper jaw bone) and mandibular (lower jaw bone) teeth, a condition that can have both esthetic, functional, and emotional implications (1). There is no clear relationship between malocclusion and either periodontal disease, dysfunction of the temporomandibular joint, or other oral problems.

Malocclusion is largely due to genetic factors, although individuals who experience premature primary tooth loss due to dental caries may later experience orthodontic problems as a result. In its minor and even moderate manifestations, malocclusion seldom creates pain and is rarely disfiguring. In its more severe form, malocclusion causes functional problems in chewing, may predispose one to periodontal conditions (due to the inability to clean between teeth), and can create significant emotional problems (due to diminished self-confidence and self-esteem) (1).

Treatment: Many malocclusions of a minor variety can be prevented, intercepted, or corrected by the supervision of a dentist and provision of space maintenance appliances or minor orthodontic treatment. The correction of more major malocclusions typically requires major orthodontic treatment.

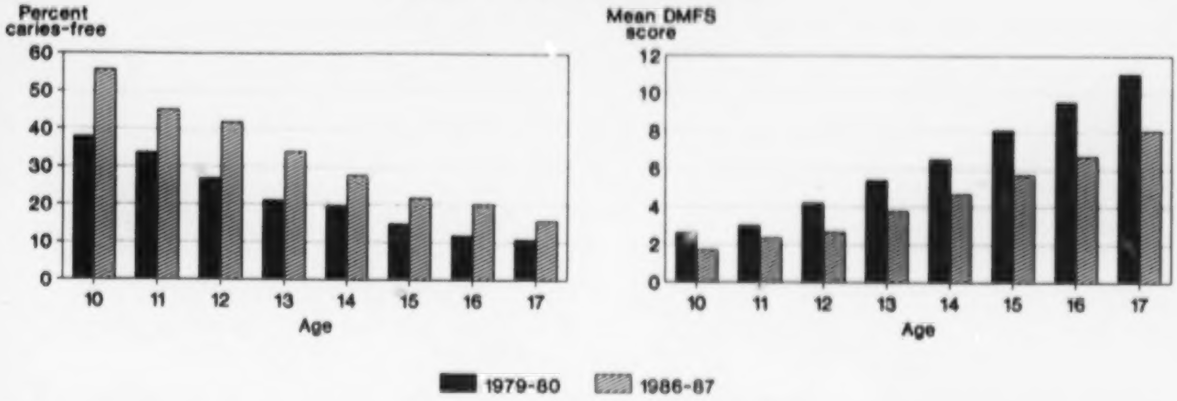
Orthodontic Treatment Priority Index (TPI): Determining the prevalence and severity of malocclusion is a complicated procedure and is, ultimately, subjective. Survey data reflect the judgment of orthodontists who have examined patients and a variety of records, including radiographs and models of teeth. From this information, a score, or orthodontic TPI, is determined. The orthodontic TPI score is a score ranging from 0 (normal occlusion) to 10 (very severe occlusion, with treatment mandatory). A TPI score of 4 to 6 is considered a definite malocclusion, but treatment is elective.

SOURCES: Office of Technology Assessment, 1991, based on the following sources: American Academy of Pediatric Dentistry, ''Guidelines for Dental Health of the Adolescent,'' Chicago, IL, May 1986; M. Bhat, ''Periodontal Attachment Loss in 14- to 17-Year-Old U.S. School Children,'' Program and Abstracts, American Association for Public Health Dentistry, November 1989; M. Bhat and J. Brunelle, ''Gingival Status of 14- to 17-Year-Old U.S. School Children,'' *Journal of Dental Research* 68:955, June 1989; U.S. Congress, Office of Technology Assessment, *Periodontal Disease: Assessing the Effectiveness and Costs of the Keyes Technique—Health Technology Case Study #5*, OTA-BP-H-9 (Washington, DC: U.S. Government Printing Office, May 1981); U.S. Department of Health, Education, and Welfare, Public Health Service, National Center for Health Statistics, *Decayed, Missing and Filled Teeth Among Children*, DHEW Pub. No. (HSM)72-1003 (Washington, DC: U.S. Government Printing Office, August 1972); and U.S. Department of Health and Human Services, Public Health Service, National Institutes of Health, National Institute of Dental Research, *Oral Health of U.S. Children: The National Survey of Dental Caries in U.S. School Children, 1986-87*, NIH Pub. No. 89-2247 (Washington, DC: U.S. Government Printing Office, September 1989).

to 17 than among their white counterparts. This means that nonwhite adolescents lost more teeth to caries than white adolescents. Finally, the F component of the DMFT index (filled teeth) represents a greater percentage of the DMFT index for white adolescents ages 10 to 17 than for nonwhite adolescents. This means that more decayed teeth of white adolescents are filled than decayed teeth of nonwhite adolescents.

Table 8-1 shows differences in selected dental treatment needs due to caries for white and nonwhite 10- and 17-year-olds in 1979-80. In every category, the needs of nonwhite adolescents exceeded those of white adolescents. The racial disparity in treatment

Figure 8-1—Caries-Free Individuals and Mean DMFS Scores Among U.S. School Children Ages 10 to 17, 1979-80 and 1986-87[a] [b]



[a] The data shown in this figure are from two national school-based surveys conducted by the National Institute of Dental Research in 1979-80 and 1986-87.
[b] The DMFS index measures the mean number per person of Decayed permanent tooth surfaces, Missing permanent teeth, and Filled Surfaces of permanent teeth.

SOURCE: Office of Technology Assessment, 1991, based on the following: **1979-80 data**: U.S. Department of Health and Human Services, Public Health Service, National Institutes of Health, National Institute of Dental Research, *National Caries Program, The Prevalence of Dental Caries in United States School Children, 1979-80*, NIH Pub. No. 82-2245 (Washington, DC: U.S. Government Printing Office, 1982). **1986-87 data**: U.S. Department of Health and Human Services, Public Health Service, National Institutes of Health, National Institute of Dental Research, *Oral Health of U.S. Children: The National Survey of Dental Caries in U.S. School Children, 1986-87*, NIH Pub. No. 89-2247 (Washington, DC: U.S.Government Printing Office, September 1989).

needs was more pronounced among 17-year-olds than among 10-year-olds.

While major school-based studies show an overall decrease in caries prevalence, other smaller studies point to a changing pattern and distribution of dental caries. Though uncommon, rampant caries[12] affects a small portion of adolescents, devastating the dentition and creating pain. Perhaps as many as one-fifth of school children get as much as half of the dental caries in the population (35). Studies of naval recruits, many of whom are older adolescents, show similar findings—5 percent of those individuals account for 38 percent of new caries (44). Although the caries-active group is small, it represents a group which seems resistant to most preventive measures that benefit the population in general.

Periodontal Disease

National representative data from NIDR's school-based surveys paint a generally positive picture of periodontal health for most American adolescents ages 14 to 17 (12,95). Although many school children do experience some gingival inflammation (signified by bleeding gums upon probing), very few have more serious problems (e.g., periodontal attachment loss of more than 2 mm). Older studies also suggest that many school children need moderate gingival treatment and improved oral hygiene (62,63, 95).

According to the NIDR 1986-87 school-based survey, nonwhite adolescents ages 14 to 17 tended to have slightly worse periodontal health than white adolescents (see figure 8-4). The percentage of nonwhite adolescents with periodontal attachment loss greatly exceeded the percentage of white adolescents with periodontal attachment loss.

Localized juvenile periodontitis (see box 8-A) affects an estimated 0.1 to 2.3 percent of U.S. adolescents (69). If untreated, the condition can cause significant periodontal destruction, including bone and tooth loss.

Malocclusion[13]

A review of available data on malocclusion found that the condition tends to worsen in adolescence (57). Crowding increases, some orthodontic prob-

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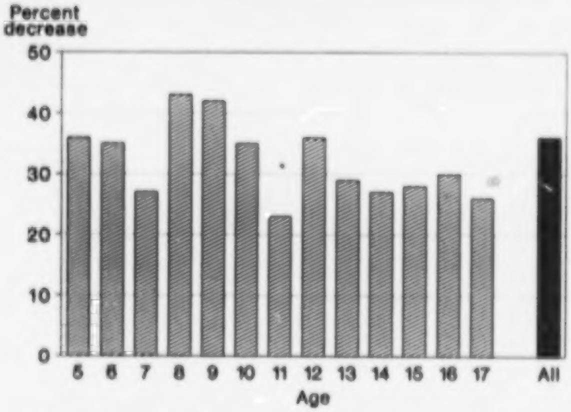
[12] *Rampant caries* is a rapidly progressing form of dental caries which by definition involves extensive breakdown of enamel and dentin, and pulpal pathosis, and can occur in patients with or without a significant caries history.

[13] Box 8-A discusses malocclusion, along with its treatment and measurement. Preventive services are discussed in a later section.

Figure 8-2—Percentage Decrease From 1980 to 1987 in Caries Prevalence Among U.S. School Children Ages 5 to 17[a]



[a]The data shown in this figure are from two national school-based surveys conducted by the National Institute of Dental Research in 1979-80 and 1986-87.

SOURCE: Office of Technology Assessment, 1991, based on the following: 1979-80 data: U.S. Department of Health and Human Services, Public Health Service, National Institutes of Health, National Institute of Dental Research, *National Caries Program, The Prevalence of Dental Caries in United States School Children, 1979-80*, NIH Pub. No. 82-2245 (Washington, DC: U.S. Government Printing Office, 1982). 1986-87 data: U.S. Department of Health and Human Services, Public Health Service, National Institutes of Health, National Institute of Dental Research, *Oral Health of U.S. Children: The National Survey of Dental Caries in U.S. School Children, 1986-87*, NIH Pub. No. 89-2247 (Washington, DC: U.S. Government Printing Office, September 1989).

lems worsen, and others become apparent later in adolescence. Estimates of malocclusion in the adolescent population available from the National Center on Health Statistics in DHHS are based on national data from 1970 (81).

Table 8-2 shows data from 1970 on the average orthodontic Treatment Priority Index score for U.S. adolescents ages 12 to 17 by sex and race.[14] White male adolescents had the highest Treatment Priority Index score (5.2), and black male adolescents had the lowest (4.6). These scores fall into a range in which there is a definite malocclusion but treatment is elective.

Table 8-3 shows a breakdown of the orthodontic Treatment Priority Index scores for all U.S. adolescents ages 12 to 17 in 1970. About 13 to 16 percent (about 3.6 million adolescents in 1970[15]) had severe to very severe malocclusion.

Factors Associated With Adolescents' Dental and Oral Health Problems

Federal sources of data on the dental health problems of adolescents include national surveys by NIDR, as well as other national surveys conducted by various agencies in DHHS (see box 8-B). These national surveys, as a whole, have yielded limited information about subgroups of the population. Available data on racial differences in dental disease patterns, for example, differentiate only between whites and nonwhites. The national surveys are not designed to explain why racial differences in dental disease patterns may occur by, for example, also collecting information on family income level or insurance status. Race, family income, and insurance status, along with education, age, sex, and perceived need, have been shown to be correlated with the use of dental services (31,82), and consequently associated with dental disease patterns. Also, past history of dental disease, oral hygiene behaviors, and diet may affect dental disease patterns.

Adolescents in certain racial and ethnic minority groups, disabled adolescents, and adolescents in institutions seem to experience greater dental disease than other adolescents. But the data on these groups of adolescents are very limited, reflecting the national data's descriptiveness, and are shallow in terms of explaining differences in disease patterns and use of dental services. Despite the limitations of the data and the possibility of misinterpretation, it is important to understand that, for whatever the reasons, some adolescents have a greater need for dental care than others. Understanding the reasons is important for designing interventions appropriate for those adolescents.

Adolescents in Racial and Ethnic Minority Groups[16]

Data from the 1979-80 NIDR survey of school children suggest that nonwhite adolescents in this country experience more unmet need for dental

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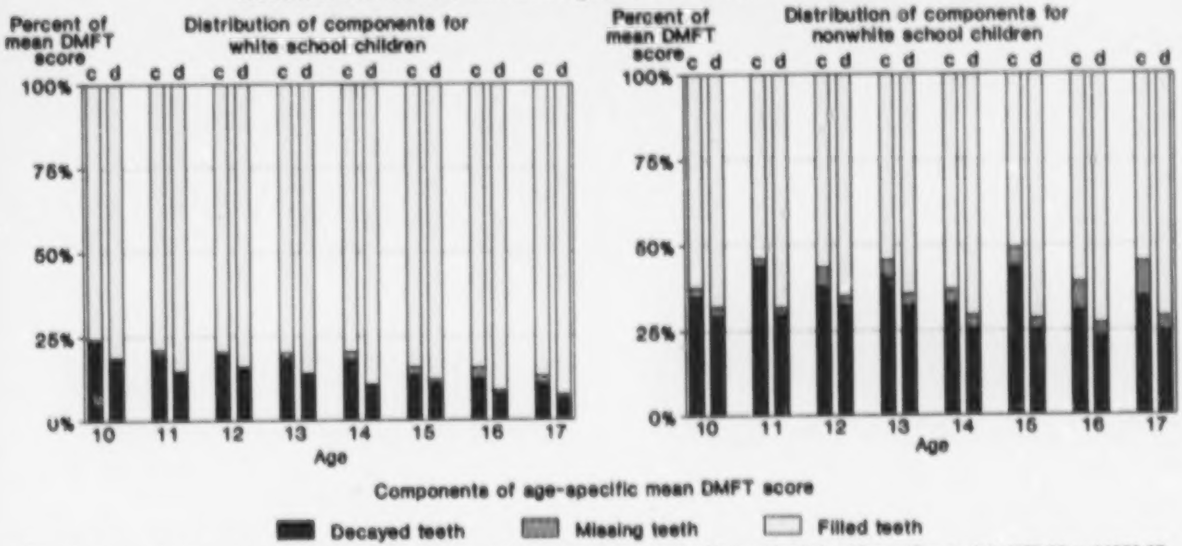
[14] The *orthodontic Treatment Priority Index* is described in box 8-A.

[15] Based on U.S. Department of Commerce, Bureau of the Census, estimates of the U.S. residents as of July 1, 1989, the equivalent number of adolescents age 12 to 17 currently affected by severe or very severe malocclusion would be between 2.6 and 3.2 million.

[16] Some sources of data on dental health separate different ethnic or racial minority groups so that the caries prevalence or other aspects of oral health are more closely related to that group. In most cases, however, minority groups are lumped together with various titles such as "minorities" or "blacks and others." The data below describe some minority groups studied in more detail.

Figure 8-3—Distribution of Components of Age-Specific Mean DMFT Scores for White and Nonwhite U.S. School Children Ages 10 to 17, 1979-80 and 1986-87[a] [b]



[a] The data shown in this figure are from two national school-based surveys conducted by the National Institute of Dental Research in 1979-80 and 1986-87.

[b] The DMFT index measures the mean number per person of Decayed, Missing, and Filled permanent Teeth.

[c] 1979-80.

[d] 1986-87.

SOURCE: Office of Technology Assessment, 1991, based on the following: 1979-80 data: U.S. Department of Health and Human Services, Public Health Service, National Institutes of Health, National Institute of Dental Research, *National Caries Program, The Prevalence of Dental Caries in United States School Children, 1979-80*, NIH Pub. No. 82-2245 (Washington, DC: U.S. Government Printing Office, 1982). 1986-87 data: U.S. Department of Health and Human Services, Public Health Service, National Institutes of Health, National Institute of Dental Research, *Oral Health of U.S. Children: The National Survey of Dental Caries in U.S. School Children, 1986-87*, NIH Pub. No. 89-2247 (Washington, DC: U.S. Government Printing Office, September 1989).

treatment than their white peers (see table 8-1).[17] Because of these needs, nonwhite adolescents experience undesirable effects from dental conditions—restricted-activity days,[18] bed-disability days,[19] and lost school days—to a greater degree than their white peers do (88).

In 1986-87, according to NIDR, 22 percent of 10-year-olds needed restoration (filling) of permanent teeth (94). For white 10-year-olds, the figure was slightly under 19 percent; for nonwhite 10-year-olds, though, the percentage was over 32 percent. The need for restoration of permanent teeth changes through adolescence. In 1986-87, over 12 percent of all 17-year-olds needed restorations—8 percent of white 17-year-olds and 29 percent of nonwhite 17-year-olds (97).

In 1983-84, the Indian Health Service in the Public Health Service of DHHS conducted a study of Indian children on reservations and in other areas served by the Indian Health Service and found that, overall, American Indian children have twice the amount of dental caries as the national average (90). The mean DMFT score for 13- to 19-year-olds ranged from a low of 9.4 in Southwestern Indians to a high of 12.7 in those from the Northwest. The F (filled teeth) component of the DMFT, an indicator of treated caries, ranged from 50 to 77 percent (i.e., that half to three-quarters of decayed teeth were filled).

A study in Colorado showed that children of migrant workers between ages 11 and 15 had a DMFS rating of 5.87, exceeding the DMFS rate of

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[17] Available data differentiating oral health status by race do not take socioeconomic status or other, possibly confounding, factors into account. For example, a 1982-84 survey of Mexican-Americans (not specifically adolescents, however) found that an individual's level of acculturation was significantly associated with the prevalence of gingivitis and periodontal pocketing (i.e., those with low acculturation status had significantly higher disease levels than those with high acculturation status) (45a).

[18] *Restricted-activity days* are days on which a person's activity is restricted by illness or injury.

[19] *Bed-disability days* are days on which a person spends more than half the day in bed because of illness or injury.

Table 8-1—Selected Dental Treatment Needs of White and Nonwhite U.S. Adolescents Ages 10 and 17, 1979-80[a]

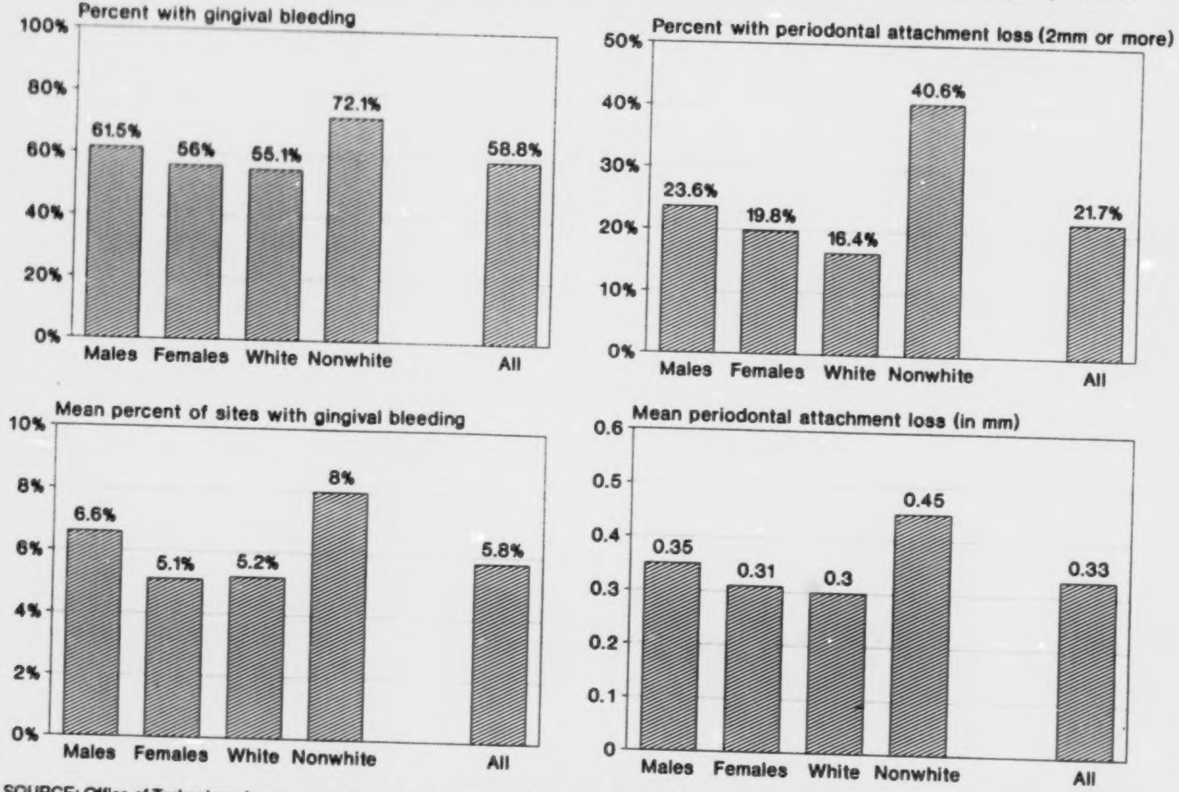
	Percent of adolescents in need of:							
	Tooth extractions[b]		Pulpal therapy		Tooth replacement		Need for crowns	
Age (years)	White	Nonwhite	White	Nonwhite	White	Nonwhite	White	Nonwhite
10	0.5	2.8	1.2	1.8	1.1	1.8	2.0	2.3
17	2.1	10.4	1.3	6.9	6.7	17.9	3.5	10.8

[a] Analogous data were not reported in 1986-87 (97).

[b] Permanent tooth extractions due to disease.

SOURCE: U.S. Department of Health and Human Services, Public Health Service, National Institutes of Health, National Institute of Dental Research, *Dental Treatment Needs of United States Children, 1979-80*, NIH Pub. No. 83-2246 (Washington, DC: U.S. Government Printing Office, December 1982).

Figure 8-4—Periodontal Health Status of U.S. School Children Ages 14 to 17, by Gender and Race, 1986-87



SOURCE: Office of Technology Assessment, 1991, based on the following: Gingival status: M. Bhat, "Periodontal Attachment Loss in 14- to 17-Year-Old U.S. School Children," Program and Abstracts, American Association for Public Health Dentistry, Richmond, VA, 1989; Periodontal attachment: M. Bhat and J. Brunelle, "Gingival Status of 14- to 17-Year-Old U.S. School Children," *Journal of Dental Research* 68:955, June 1989.

the general U.S. population of that age (16). A study in Minnesota showed that by age 13, 73 percent of the occlusal (biting) surfaces of migrant children's first permanent molars were decayed, missing, or filled (24). A study in Michigan showed that migrant children 5- to 14-years-old had consistently higher DMFS scores than other nonmigrant children (104).

Figure 8-5 shows the gingival treatment needs of white and nonwhite U.S. adolescents ages 10 to 17 in 1979-80 using a scoring system from 0 (low need) to 4 (high need). The percentages of adolescents who had moderate or serious gingival problems (or were not scored) were generally higher among nonwhite than among white adolescents.

Data from the Indian Health Service study show that by the end of adolescence, two out of five young American Indian patients have destructive periodontal disease with bone loss (90). Six out of ten American Indian children ages 19 and under have gum disease.

Data from NIDR suggest that only a small percentage of U.S. children receive orthodontic care (95). In 1979-80, about 25 percent of 17-year-olds had ever received any orthodontic treatment but black adolescents were far less likely to have received it (4 percent of black adolescents had ever received orthodontic treatment) than white adolescent (27 percent had ever received orthodontic treatment) (95). Although it appears that malocclusion occurs consistently across races (see table 8-2), the treatment of orthodontic problems does not seem to reflect the distribution of this problem.

In 1987, restricted-activity days due to acute dental conditions averaged 1.5 days per 100 persons per year for U.S. children 5 to 17 years of age (88). In 1987, black children under age 18 had slightly more restricted-activity days than whites of the same age (6.9 days per 100 persons for black children v. 5.6 days per 100 persons for white children).

Black children under age 18 in this country suffer more bed-disability days due to acute dental conditions than whites. In 1987, black children under age 18 had 4.3 bed-disability days per 100 persons per year due to acute dental conditions, while white children under age 18 had only 1.4 bed-disability days (88).

Black children ages 5 to 17 in this country experience almost four times as many school days lost due to acute dental conditions as whites do. In 1987, black children ages 5 to 17 lost 3.9 school days per 100 persons per year due to acute dental conditions, while white children lost 1.0 school day per 100 persons per year (88). The impact of acute dental conditions as compared to other acute conditions on school performance or work is not known.

Table 8-2—Malocclusion Among U.S. Adolescents Ages 12 to 17, by Race and Gender, 1970

	Orthodontic Treatment Priority Index (TPI) score[a]			
	White		Black	
Age (years)	Male	Female	Male	Female
12	5.2	5.6	4.1	4.9
13	5.2	5.0	4.2	5.6
14	5.1	4.7	4.8	6.1
15	5.5	4.8	5.0	4.9
16	4.9	4.6	5.3	5.0
17	5.4	4.8	4.5	3.9
For group	5.2	4.9	4.6	5.1

[a] The orthodontic Treatment Priority Index (TPI) score is a score ranging from 0 (normal occlusion) to 10 (very severe malocclusion with treatment mandatory); a TPI score of 4-6 is considered a definite malocclusion, but treatment is elective.

SOURCE: U.S. Department of Health, Education, and Welfare, Public Health Service, National Center for Health Statistics, *An Assessment of the Occlusion of the Teeth of Youths 12-17 Years*, DHEW Pub. No. (HRA)77-1644 (Washington, DC: U.S. Government Printing Office, February 1977).

Data from the National Health Examination Survey of the late 1960s suggest that white U.S. adolescents ages 12 through 17 tend to have slightly better oral hygiene as measured by the Simplified Oral Hygiene Index than black adolescents (see table 8-4),[20] although both blacks' and whites' scores were representative of relatively good oral hygiene. The racial differences may reflect personal oral hygiene behaviors which may be related to access to care, patient education, or other factors.

Adolescents With Disabilities[21]

A reliable picture of the dental health of U.S. adolescents with disabilities is unavailable. Adolescents with disabilities (and disabled people of other ages) have not been well-evaluated for dental caries. Most studies of dental caries among disabled people have been small in scale and have used a variety of indices. The lack of data, variety of indices, and inadequate control of variables in many studies make conclusions about the extent to which dental caries affects disabled adolescents difficult to draw. The discussion that follows draws on the few good studies that are available.

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[20] The Simplified Oral Hygiene Index, as noted in box 8-A, is a measure of oral cleanliness and plaque control. A low score indicates good oral hygiene.

[21] As discussed in ch. 6, "Chronic Physical Illness: Prevention and Services," in this volume, the term disabled is used in many ways. In 1982, OTA distinguished between a *disability* (i.e., a limited ability or inability to perform one or more basic life functions—at a level considered "typical") and a *handicap* (i.e., an inability to perform one or more life functions—e.g., working—at a "typical" level because of the interaction of the individual's disability with the physical and social environments) (77). The terms handicapped and disabled have not been used consistently in studies of dental disease, and the national dental surveys described earlier did not break down the study samples into disabled and nondisabled. The discussion here uses the term disabled as the general term for both disabled and handicapped adolescents.

Table 8-3—Distribution of Malocclusion Among U.S. Adolescents Ages 12 to 17, by Race and Gender, 1970

	Percent with orthodontic Treatment Priority Index score								
	White and black			White			Black		
TPI score	Both	Male	Female	Both	Male	Female	Both	Male	Female
0 = normal occlusion	11.0	10.8	11.2	10.5	10.2	10.7	14.7	15.0	14.3
1-3 = minor malocclusion	34.8	34.0	35.8	34.5	33.6	35.7	36.9	36.4	37.3
4-6 = definite malocclusion	25.2	25.7	24.6	25.8	26.0	25.5	21.0	23.3	18.8
7-9 = severe malocclusion	13.0	12.8	13.0	13.0	12.7	13.2	12.2	13.5	11.0
10 = very severe malocclusion	16.0	16.7	15.4	16.7	17.5	14.9	15.2	11.8	18.6

SOURCE: U.S. Department of Health, Education, and Welfare, Public Health Service, National Center for Health Statistics, *An Assessment of the Occlusion of the Teeth of Youths 12-17 Years*, DHEW Pub. No. (HRA)77-1644 (Washington, DC: U.S. Government Printing Office, February 1977).

Using data drawn from more than 20,000 disabled patients in 1984, Nowak demonstrated a mean DMFT score among 13- to 17-year-old disabled adolescents of 6.0; this compared to a DMFT score of 6.3 for an analogous age cohort in the general population (58). The breakdown of the DMFT score for 11- to 15-year-old disabled adolescents (1.18 (D), 2.48 (M), and 2.09 (F)) suggests that disabled adolescents are receiving treatment for dental caries but continue to have dental caries that progress to tooth loss.

A review of the literature by Tesini shows that periodontal conditions are a significantly greater concern for disabled adolescents than is caries (75). The probable reason is that the prevention of periodontal diseases involves good oral hygiene practices which may be given low priority by those caring for disabled persons or require a dexterity some disabled persons may not have.

Disabled adolescents who are unable to engage in a major activity (i.e., attend school) tend to visit the dentist at a rate similar to the rate among other underserved groups (87). In 1986, only 54.4 percent of seriously disabled adolescents between the ages of 12 and 17 had at least an annual dental visit (87). Disabled adolescents with less disability or limitation did only slightly better. In 1986, 62.2 percent of less seriously disabled adolescents between the ages of 12 and 17 had at least an annual dental visit (87). Disabled adolescents' infrequent dental visits may be related to a variety of factors, including preoccupation with their disabling condition (26), inability to find a dentist (70), or financing[22] (33).

Adolescents in Juvenile Justice Facilities

Small studies have shown that adolescents ages 13 through 16 who are in juvenile justice facilities had more dental decay (as well as poorer nutritional status, and more vision and hearing impairments) than adolescents from similar communities who had never been in juvenile justice facilities (64). It is not clear, however, what the dental status of these adolescents was prior to entering juvenile justice facilities.[23]

Adolescents With Certain Behaviors or Conditions

A variety of behaviors and conditions affect adolescents' oral health—*behaviors* that include ignoring personal dental hygiene practices, using alcohol and other substances, using oral contraceptives, using smokeless tobacco or smoking cigarettes, participating in athletics (and experiencing related injuries), and *conditions* that include bulimia nervosa,[24] pregnancy, and sexually transmitted diseases (see table 8-5). Some of these behaviors and conditions occur infrequently but result in long-term damage to oral structures when they occur. Others occur more frequently but have minor or reversible effects.

Prevention of Adolescents' Dental and Oral Health Problems

The major dental and oral health problems faced by adolescents in the United States—i.e., dental

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[22] For further discussion of financing issues in dental care, see: the discussion below; ch. 16, "Financial Access to Health Services," in Vol. III, and U.S. Congress Office of Technology Assessment, *Children's Dental Services Under the Medicaid Program* (78).

[23] For further discussion of the health needs of adolescents in juvenile justice facilities, see ch. 13, "Delinquency: Prevention and Services," in this volume.

[24] *Bulimia nervosa* is a severe eating disorder characterized by a compulsion to binge and then purge the body by self-induced vomiting or use of laxatives. For a further discussion, see ch. 7, "Nutrition and Fitness Problems: Prevention and Services," in this volume.

Box 8-B—Federal Sources of Data on Adolescents' Dental and Oral Health

Several components of the Public Health Service within the U.S. Department of Health and Human Services collect data on adolescents' dental and oral health:

National Institute of Dental Research (NIDR), National Institutes of Health

—*National Dental Caries Prevalence Survey, 1979-80*: data on DMFS and DMFT, specific dental treatment needs, by age and race (white and nonwhite), and gingival health assessment of U.S. school children.

—*National Survey of Dental Caries in U.S. School Children: 1986-87*: data on DMFS and DMFT, by age, race (white and nonwhite), and geographic location, and gingival health assessment of U.S. school children.

National Center for Health Statistics, Centers for Disease Control

—*National Health Interview Survey (NHIS), annual*: data on utilization of dental services by age, income, and residence; acute dental conditions and associated restricted-activity days, bed-disability days, lost school days by age and gender, and race and family income. Usually, these questions are asked of adults about their children. The 1982 survey included a Preventive Care Supplement, which included data on the first dental visit. The 1985 survey included a special Health Promotion and Disease Prevention Questionnaire, with a dental component.

—*National Health and Nutrition Examination Survey (NHANES) III, 1988-94*: data collected from questionnaires as well as from physical and oral examinations. Data collection will span from 1988 through 1994 and will include persons 2 months old and older. The dental component will include an assessment of caries, periodontal status, tooth loss, soft-tissue lesions, malocclusion, and tooth trauma.

National Center for Health Services Research (now Agency for Health Care Policy and Research)

—*National Medical Care Expenditure Survey (NMCES), 1977*, and *National Medical Expenditure Survey (NMES), 1987*: data on dental expenditures and utilization of services, by age, race, and family income.

Several authors involved in dental epidemiology and research, as well as dental public health, have noted that *Federal data collection programs may not provide accurate projections of dental and oral health need within special populations* (22,35,90). For example, the NIDR surveys of U.S. school children differentiate only between white and nonwhite children and include only those children who attend school. This approach to data collection may yield information about aggregate trends but is likely to mask the disease status and treatment needs of certain populations.

SOURCE: Office of Technology Assessment, 1991.

caries, periodontal disease, and malocclusion—are often preventable conditions. Effective preventive measures involve water fluoridation and other preventive efforts at the community level, the services of dental professionals, and personal dental hygiene practices.

Preventive Interventions for Major Dental Health Problems

Prevention of Dental Caries

Dental caries, the major dental infectious disease problem for adolescents, can be prevented in the following ways:

- by increasing the resistance of the teeth via the use of fluoride and dental (occlusal) sealants,[25]
- by reducing or interfering with the caries-producing microorganisms in contact with the teeth through the use of fluoride and oral hygiene procedures, and
- by altering a person's oral environment through dietary interventions (36).

Fluoride—Fluoride has been key in the overall reductions in dental caries among adolescents. According to the American Academy of Pediatric Dentistry, adolescents can benefit from fluoride throughout their teenage years and into early adulthood (1a). The benefit of incorporating fluoride into the developing enamel of permanent teeth ends around age 14 (or at the time of the eruption of the second permanent molars) (36), but the benefits of remineralization and the antimicrobial activity of fluoride continue beyond that age (1a). These

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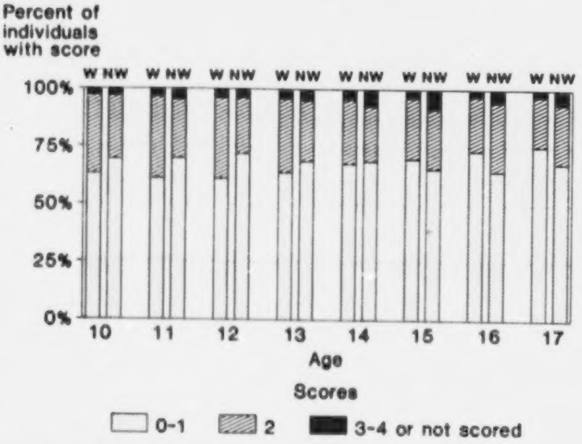
[25] *Dental sealants* are thin coatings of plastic material placed on the occlusal (chewing) surfaces of posterior teeth to prevent the accumulation of food debris and bacteria in the pits and fissures of these teeth and subsequent dental decay (36).

Figure 8-5—Gingival Treatment Needs of White and Nonwhite U.S. Adolescents Ages 10 to 17, 1979-80



NOTE: W = White; NW = Nonwhite
Scoring Criteria: 0 = free of disease; 1 or 2 = needs minor treatment; 3 = moderate problem; 4 = disease will not respond to self-care.

SOURCE: U.S. Department of Health and Human Services, Public Health Service, National Institutes of Health, National Institute of Dental Research, *Dental Treatment Needs of United States Children 1979-80,* NIH Pub. No. 83-2246 (Washington, DC: U.S. Government Printing Office, December 1982).

benefits can be obtained through water fluoridation,[26] through fluoride that is topically applied by a dental professional, or through the use of fluoride rinses or fluoride-containing toothpaste (1a).

Water fluoridation programs have been demonstrated effective in reducing caries in several studies, resulting in a 20- to 40-percent reduction in caries (9,13,14,23,25,47,50,58).[27] As of 1988, nearly two-thirds (61 percent) of the U.S. population served by public water supplies had access to fluoridated drinking water (84a). The Federal Government has provided assistance for water fluoridation programs through grants to States and also through technical assistance, health education, and other methods. The Dental Disease Prevention Activity of the Centers for Disease Control in the Public Health Service of DHHS has been responsible for the Federal Government's water fluoridation effort since 1978 (22).

Table 8-4—Oral Hygiene Among U.S. Adolescents Ages 12 to 17 as Measured by the Simplified Oral Hygiene Index (OHI-S), 1966-1970

Age (years)	OHI-S score[a]	
12	0.94	
13	0.92	
14	0.90	
15	0.87	
16	0.86	
17	0.82	
	White	Black
12-17	0.82	1.34

[a] The Simplified Oral Hygiene Index (OHI-S) is a measure of oral cleanliness and plaque control. A high score indicates poor oral hygiene.

SOURCE: U.S. Department of Health, Education, and Welfare, Public Health Service, National Center for Health Statistics, *Oral Hygiene Among Youths 12-17 Years,* DHEW Pub. No. (HRA)76-1633 (Washington, DC: U.S. Government Printing Office, 1976).

In 70 clinical trials of professionally applied topical fluoride, caries was reduced by an average of 30 percent (66). A recent OTA study that sampled seven State Medicaid programs found that professionally applied topical fluoride was a covered dental benefit for adolescents in six of seven programs (78).[28] Limitations in State reporting requirements to the Federal Government preclude a determination of how many Medicaid-eligible adolescents actually had fluoride topically applied by a dental professional. The American Dental Association has suggested the inclusion of professionally applied topical fluoride in a model dental health insurance benefit (3).

Nonprofessionally applied topical fluoride, such as that contained in fluoride toothpastes or mouth rinses, is also effective in reducing dental caries. School fluoride rinse programs have been shown to reduce the prevalence of dental caries among participating school children from 16 to 56 percent (17), although there is some evidence that those children in nonfluoridated communities may experience greater benefit (67a). Approximately 10 percent of U.S. school children ages 5 to 17 have access to school fluoride rinse programs (87).

Dental Sealants—According to the Sealant Task Force of the Massachusetts Public Health Depart-

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[26] Recently, concerns have been raised about the carcinogenicity of sodium fluoride (the fluoride compound commonly supplemented in community water supplies). In 1990, the National Toxicology Program at the National Institutes of Health issued preliminary results of a study on the carcinogenicity of sodium fluoride in rats and mice that showed only equivocal evidence of carcinogenicity in male rats (98). After considering the weight of the evidence on sodium fluoride, the Public Health Service's stated policy is to continue appropriate support for the use of fluorides for the prevention of dental decay (98).

[27] The low-end caries reduction found in some studies may reflect the fact that control subjects were exposed to fluoride in forms other than in drinking water (e.g., fluoride toothpaste).

[28] See the following section for details of the Medicaid program and dental services.

Table 8-5—Behaviors and Conditions With Potential Effects on Adolescents' Dental and Oral Health

Behavior/condition	Potential effects on dental and oral health
Behaviors:	
Cigarette smoking	Short-term uses causes mucosal changes, staining of teeth. Long-term use results in increased oral cancer risk, periodontal disease.
Smokeless tobacco use	Same as for cigarette smoking.
Alcohol and drug use	Short-term use complicates drug administration by dentists and can cause unusual office behaviors, dental neglect in addicted patients. Long-term use is related to oral cancer.
Participation in athletics	Traumatic injuries to teeth and jaws.
Oral contraceptive use	Periodontal disease from hormonal change; increased risk of dry socket after tooth extraction.
Conditions:	
Bulimia	Periodontal problems and acid destruction of teeth from vomiting.
Pregnancy	Gingival inflammation.
Sexually transmitted disease	Oral infections.
HIV infection	Periodontal disease; access to care may be restricted.
Stress	Oral infection.

SOURCE: P.S. Casamassimo, S.L. Bronstein, J. Christensen, et al., "Periodontal Disease and Temporomandibular Joint Disorders," *Pediatric Dentistry, Infancy Through Adolescence*, J.R. Pinkham, P.S. Casamassimo, H. Fields, et al. (eds.) (Philadelphia, PA: W.B. Saunders Co., 1988). Reprinted by permission.

ment, a combination of fluoride and dental sealants is the most effective preventive approach to reducing dental caries (13,56). The National Preventive Dentistry Demonstration Program[29] similarly found that a program combining fluoride, sealants, and dental health education[30] had greater benefit than did programs with fewer preventive techniques both in communities with fluoridated water and communities without it (10).

In 1983, the National Institutes of Health held a consensus conference on dental sealants, and the consensus development group recommended the use of sealants for the prevention of dental caries (91).

Despite such recommendations, in 1986, fewer than 10 percent of U.S. adolescents had dental sealants (101). Various factors, including practitioner attitudes, low public awareness, low priority for dental health, and cost, have limited the availability of sealants to adolescents (100).

The Bureau of Maternal and Child Health and Resources Development within the Health Resources and Services Administration of DHHS has funded dental sealant programs through competitively awarded funding for its special projects of regional and national significance (SPRANS) (8). State agencies are utilizing Federal funds to initiate sealant programs in various parts of the country (71). The National Institutes of Health and the Center for Disease Control's Dental Disease Prevention Activity effort to encourage the use of sealants continues in this regard with grants to States and public awareness programs (21). On the other hand, the American Dental Association reported in 1988 that only 22 State Medicaid programs (including the District of Columbia) covered dental sealants, and at least one State recently discontinued sealants from its program (2).[31]

Personal Oral Hygiene—Some studies show that meticulous oral hygiene (i.e., including prophylaxis (cleaning) by a dental professional) can virtually eliminate dental caries (5,6,7). To OTA's knowledge, however, there are no clinical trials that show what effects toothbrushing without fluoride toothpaste or flossing has on dental caries (36).

Other Dietary Measures—Restricting sugary foods in the diet has significantly reduced dental caries in clinical trials (41,42). This approach has less pronounced effects on dental caries when sugar-restricted diets are not carefully controlled (68,96).

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[29] The National Preventive Dentistry Demonstration Program was conducted jointly by the American Fund for Dental Health and the RAND Corp. and was funded by the Robert Wood Johnson Foundation. The program spanned 4 years and included school children from 10 communities around the country (67a).

[30] Dental health education is discussed in a separate section below.

[31] It should be noted that some Medicaid dental sealant benefits are limited in scope, allowing only limited application of sealants (e.g., one sealant per tooth per lifetime) or allowing sealants only on limited teeth (e.g., only bicuspids and molars within 3 years of eruption), for limited ages (e.g., only for children ages 12 and under), or for limited populations (e.g., for developmentally disabled children only) (78).

Prevention of Periodontal Disease

The prevention of periodontal disease requires good personal oral hygiene habits, including brushing and flossing, to remove plaque from all teeth surfaces (43,52,73). Personal oral hygiene is also important because gingivitis can be reversed through personal plaque control. Periodontitis is a much more severe disease state and usually requires professional treatment to prevent progression, but personal oral hygiene must be practiced as well (76).

In addition to personal hygiene measures, prophylaxis (cleaning) by a dental professional at least once a year is generally recommended to prevent periodontal diseases (37). The American Dental Association has suggested the inclusion of prophylaxis by a dental professional in a model dental health insurance benefit (3).

Most of the seven State Medicaid programs sampled in a recent OTA study covered dental prophylaxis for adolescents at least annually (one program limited the benefit to children under age 12) (78).

Prevention of Malocclusion

The genetic basis of much of malocclusion in adolescents makes it unpreventable (1a). As noted earlier, however, malocclusion is sometimes caused by the premature loss of primary teeth due to dental caries. The timely use of space-maintaining appliances effectively prevents the shift of teeth that results from the premature loss of primary teeth (37). The American Dental Association has recommended the inclusion of space maintainers as part of a model dental health insurance benefit (3).

In its study of seven State Medicaid programs mentioned previously, OTA found that all seven programs limit coverage of space maintainers for adolescents (78).

Dental Health Education and Behaviors

Dental Health Education

The benefits of dental health education for adolescents are hard to assess. Although such education may tend to increase knowledge (102), its lasting effect on attitudes and behaviors appears less significant (28). Recent data suggest that adolescents have positive attitudes toward dental health, and that their attitudes improve with education and result in better behaviors (102). There is some indication that concerns about self-image and appearance can encourage good oral health behaviors for adolescents (1,53,54).

A primary locus for receipt of dental health education is during the dental visit (30), although the effectiveness of education in this setting is unknown. This locus presents an obvious problem for adolescents without frequent access to professional dental care. Health care providers other than dentists may have potential for either providing oral health information or providing referrals to dental professionals.

School health education programs are another locus for adolescents' receipt of oral hygiene information, but health education programs are not consistent across schools and generally provide little emphasis on older adolescents, who are at higher risk (30). Some evidence suggests the positive value of these programs if both parents and children are involved, but many programs have been found to be inadequate because they fail to involve the parents (59).

There is no central repository of oral health educational materials (29), although such a repository might inject a consistent element into school-based programs and office- or clinic-based educational materials. Further, adequate evaluations of educational programs and interactions are scarce, specifically in relation to adolescents.

Adolescents' Knowledge of and Attitudes Toward Dental Health

Although there is no similar information for adolescents, data from DHHS national surveys suggest that young adults (ages 18 to 29) know as much as or more than older adults about the benefits of fluoride, the positive effects of brushing and flossing on periodontal health, and the anticaries benefit of sealants (83). Higher income and education levels of these young adults were associated with a greater knowledge of these preventive benefits. Racial differences in young adults' knowledge are small (suggesting that many have been exposed to preventive information), but nonwhites do appear to know less about sealants than do whites.

A small study of adolescents in Minneapolis found that almost 75 percent of the predominantly white adolescents sampled had a regular dentist (54). Ninety percent said they brushed their teeth daily, and 80 percent felt tooth decay was a serious problem. Eighty-four percent believed that caries was preventable, though few knew much about preventive methods. A study of inner-city, largely black adolescents found that study participants were good at assessing their overall oral health, but they were not as good at assessing their gingival health status when compared with a dentist's assessment (15).

Adolescents' responsibilities in health care-seeking change over the course of adolescence. During the first part of adolescence, an adolescent typically depends on a parent or legal guardian for the initiation of health care visits; at the end of adolescence, decisions about care-seeking are increasingly likely to be a personal decision. Utilization of dental care parallels this change; dental visits drop off in the transition between adolescence and young adulthood (83). Meanwhile, the acute manifestations of dental conditions consistently increase in the early adult period (87).

Interventions and Services for the Treatment of Adolescents' Dental and Oral Health Problems

Interventions for the Treatment of Adolescents' Dental Health Problems

The usual therapies for dental caries include fillings (restorations), pulpal therapy, and, sometimes, removal of the affected tooth (see box 8-A). Therapies for periodontal disease include plaque removal, in the case of uncomplicated gingivitis, and various surgical and nonsurgical treatments, in the case of more serious periodontal disease. The treatment of malocclusion depends on its severity. Minor malocclusions can often be corrected by space-maintaining appliances or minor orthodontic treatment. Major malocclusions may require major orthodontic treatment. Few, if any, efforts have been made to trace the effects of specific interventions for the treatment of dental health problems from adolescence into adulthood.

The Dental Service Delivery System

Access to services in the U.S. dental care service delivery system is strongly influenced by the ability of patients to pay for services. Family income is directly associated with adolescents' utilization of dental care (39,87). Most oral health services are provided in private practices, which represent 85 percent of dentists (45), and are provided to middle- and upper-income patients (40). The likelihood that an adolescent has had a dental visit within the last year increases with family income (see figure 8-6). The likelihood also increases with private dental insurance. About four of five 12- to 17-year-olds with private dental insurance make at least annual visits to the dentist, while only about three of five without private dental insurance make such visits (87). The private dental insurance status of adolescents in various categories (gender, race/ethnicity, family income, activity limitation) is shown in table 8-6. Many adolescents from low-income families rely on public clinics or public insurance or both. Many public dental programs are federally sponsored (see below), but State and local governments are also active in providing dental health education and services to adolescents from low-income families.[32] The size and scope of both State and local dental programs vary considerably. Local dental programs are more likely to provide clinical services than State dental programs (46). In a recent survey of local dental health agencies, 109 of 127 local health agencies that provide for clinical services (80 percent of survey respondents) provided them to adolescents (51). The clinical components were generally limited to preventive, emergency, and basic restorative services. Some local health agencies providing dental education programs targeted junior high (52 of 125 agencies) or high school (34 of 125 agencies) students, but twice as many (104 of 125 agencies) targeted elementary school students.

Federal Programs Pertaining to Adolescents' Dental and Oral Health

DHHS is the primary locus of Federal dental and oral health programs. Several DHHS agencies are involved in dental and oral health programs:

- the Public Health Service, which includes the National Institute of Dental Research (NIDR)

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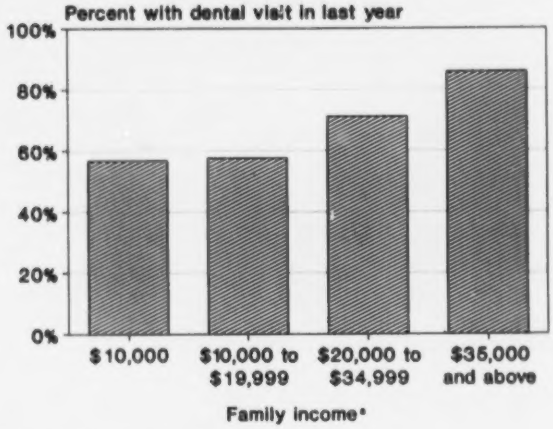
[32] Funding for local agencies comes from a variety of sources, including local taxes, State grants, Federal grants, revenue sharing, direct payment, and third-party reimbursement (including Medicaid).

Figure 8-6—Percentage of U.S. Adolescents Ages 12 to 17 With a Dental Visit in the Past Year, by Family Income,[a] 1986



[a] Family income was adjusted for family size.

SOURCE: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Center for Health Statistics, *Use of Dental Services and Dental Health, 1986*, DHHS Pub. No. (PHS)88-1593 (Washington, DC: U.S. Government Printing Office, October 1988).

of the National Institutes of Health; the Health Resources and Services Administration, which provides dental care through its National Health Service Corps; the Indian Health Service; and various other Public Health Service agencies (e.g., Centers for Disease Control); and

- the Health Care Financing Administration, which administers the Medicare and Medicaid programs.

In fiscal year 1988, as shown in figure 8-7, these DHHS agencies spent nearly $580 million on oral and dental health (32). Almost 4 percent of total Medicaid expenditures for adolescents ages 10 to 18 was spent on dental services in fiscal year 1988 (82a).

An Interim Study Group on Dental Activities appointed by DHHS in 1987 found that a focus for dental and oral health activities within DHHS was lacking (45). That study group suggested that a central focus for oral health activities should be located within the Public Health Service at the Office of the Assistant Secretary for Health and should be advised by a formally chartered committee (45).

Table 8-6—Private Dental Insurance Status of U.S. Adolescents Ages 12 to 17, by Various Demographic Categories, 1986[a]

Demographic category	Percent with private dental insurance	Percent without private dental insurance
Males	44.0%	52.1%
Females	42.2	53.3
Whites	45.6%	50.3%
Blacks	30.2	65.2
Hispanic	35.1	60.5
Mexican-American	36.8	59.6
Other Hispanic	33.0	61.7
Family income:		
Under $10,000	10.6%	86.5%
$10,000-$19,999	28.3	67.9
$20,000-$34,999	50.5	46.6
$35,000 or more	63.1	33.8
Unable to engage in major activity[b]	26.0%	74.0%

[a] Totals do not equal 100 due to unknown coverage.
[b] Disabled.

SOURCE: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Center for Health Statistics, *Use of Dental Services and Dental Health, 1986*, DHHS Pub. No. (PHS)88-1593 (Washington, DC: U.S. Government Printing Office, October 1988).

Public Health Service

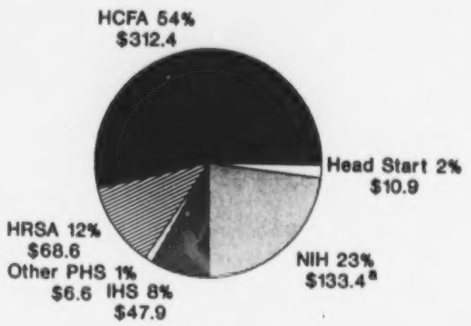
The Public Health Service has many responsibilities for the Nation's oral health, including research on oral health problems, support of community fluoridation efforts, and support for the direct provision of services.

NIDR, one of the National Institutes of Health, is the primary agency supporting Federal research on oral health—the causes, prevention, diagnosis, and treatment of oral and dental diseases and conditions. The limitations of national surveys conducted by NIDR were discussed previously.

The Federal Government's water fluoridation activities, as mentioned previously, are overseen by the Centers for Disease Control's Dental Disease Prevention Activity. Water fluoridation programs have been shown effective in reducing dental caries, but almost one-third of the U.S. population served by public water supplies lacks access to fluoridated water (67a).

In September 1989, the Bureau of Maternal and Child Health and Resources Development within the Health Resources and Services Administration of the Public Health Service sponsored a Workshop on the Oral Health of Mothers and Children (72). A full

Figure 8-7—Dental and Oral Health Expenditures by the U.S. Department of Health and Human Services, Fiscal Year 1988



($ in millions)

ABBREVIATIONS: HCFA = Health Care Financing Administration, HRSA = Health Resources and Services Administration, IHS = Indian Health Service, NIH = National Institutes of Health, PHS = Public Health Service.

[a]The National Institutes of Health includes the National Institute of Dental Research.

SOURCE: S. Ginsburg and R.E. Schmidt, *An Inventory of Resources and Activities Devoted to Dental and Oral Health in the Department of Health and Human Services* (Bethesda, MD: Richard Schmidt Associates, Ltd., April 1989).

report containing the workshop participants' recommendations should be issued soon on issues that include oral health policy, integration and collaboration, advocacy, resources for oral health, oral health education and promotion, oral health status, contributing factors, oral health standards, documentation and evaluation, and research.

Direct dental services are provided through approximately 300 community health centers and migrant health programs that receive Federal grants under section 330 of the Public Health Service Act. Section 330 grants go to public and private nonprofit organizations that provide primary health care to populations or areas that are "medically underserved." Almost all Public Health Service National Health Service Corps personnel are assigned to community health centers and migrant health programs. At least 121,000 adolescents received dental care in these centers in 1989 (55).

Another direct dental service program in the purview of the Public Health Service is the Indian Health Service, which has the responsibility for providing care to American Indians and Alaska Natives.

Health Care Financing Administration

Though the Public Health Service supports various dental and oral health activities, the Medicaid program administered at the Federal level by the Health Care Financing Administration is the largest source of public expenditures for oral health services for children and adolescents.

While Medicaid provides public health insurance for low-income people of all ages, its Early and Periodic Screening, Diagnosis, and Treatment (EPSDT) program is specifically intended to serve children under age 18 (or age 21) and is the program through which most children under Medicaid receive dental care.[33] Further, Medicaid eligibility does not translate into utilization of services. In 1988, 46 States and the District of Columbia reported that of over 9 million Medicaid recipients under age 18 who where eligible for dental services, only 26 percent had a dental service of some kind performed (2). In New Jersey, for example, only about one-third of 15- to 20-year-olds who were covered by Medicaid received dental services in fiscal year 1988.

As part of a separate study, OTA recently surveyed the Medicaid/EPSDT dental programs in seven States regarding their coverage of selected preventive and therapeutic services (78). The survey found that some of the seven State programs did not provide a minimal dental benefit package, choosing not to cover certain procedures, such as sealants, despite the Health Care Financing Administration's instructions to the contrary. The study also identified several barriers within the Medicaid program that block access to services, including structural aspects of the program, low provider participation, low fees and other reimbursement issues, and burdensome paperwork.

Conclusions and Policy Implications

In general, available national data on the U.S. adolescent school population from NIDR show a remarkable decline in the prevalence of dental caries since 1979-80. Unfortunately, the data from these surveys do not provide much information about specific subgroups of adolescents. They do show, however, that white adolescents have far fewer decayed teeth than nonwhite adolescents, fewer missing teeth due to decay, and more restored (previously decayed but treated) teeth. Other smaller studies confirm this observation within specific groups of adolescents, including the children of migrant workers and American Indians. Also, there is some evidence to suggest that adolescents with disabilities and adolescents in juvenile justice facilities have poorer dental health than the adolescent population as a whole. Other adolescents not represented in the data are those who do not attend school, since the national surveys are school-based. Oversampling of specific populations in national surveys or conducting occasional special surveys may rectify this gap in information.

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[33] For a discussion of Medicaid and its EPSDT program, see ch. 16, "Financial Access to Health Services," in Vol. III.

Another limitation of the national data on dental caries is that they do not provide information on possible confounding factors. Such factors might especially include income level and insurance status, but adolescents' perceived need of dental care, past history of dental disease, oral hygiene behaviors, and diet may also be relevant. More information on whether these factors may confound data on the prevalence of dental caries among racial or ethnic minority groups is necessary to further define the apparent differences between national white and nonwhite prevalence rates and to design appropriate interventions.

The most recent data on periodontal disease in adolescents (1986-87) from NIDR do not suggest severe periodontal problems in most adolescents, but rather, fairly widespread mild gingival conditions. Nonwhite adolescents tended to experience more gingival and periodontal problems than white adolescents.

Malocclusion, another dental problem for some adolescents, has not been studied or analyzed recently. Old data (1970) suggest that malocclusion is a problem that requires treatment for nearly 30 percent of adolescents. In 1979-80, about 25 percent of 17-year-olds had ever received any orthodontic treatment, but black adolescents were far less likely to have received it (96 percent of black adolescents had never received orthodontic treatment) than white adolescents (73 percent had never received orthodontic treatment), though there do not appear to be great differences in the occurrence of severe malocclusion conditions (81). An additional complication, besides the lack of recent data, is that the measurement tool used to assess the severity of malocclusion is subjective, rendering absolute conclusions based on the available data questionable.

Conclusions about the prevalence of these dental problems are limited by the data, but it is clear that there are discrepancies in the occurrence of these dental problems among groups of adolescents. Interestingly, there are also discrepancies among adolescents in their access to dental services; dental insurance and income are primary factors influencing an adolescent's dental visit within the past year. Adolescents from low-income families are the least likely to have private dental insurance and are also the least likely to have visited a dentist within the last year. Similarly, white adolescents are more likely than nonwhite adolescents to have private dental insurance and are more likely than black adolescents to have had a dental visit. There is no direct evidence to suggest that adolescents who suffer the worst dental problems have the least access to dental services, but the possibility that this may be the case would seem to warrant further studies of certain groups of adolescents.

Publicly funded dental programs may not be accessible to all low-income adolescents; of over 9 million Medicaid recipients under age 18 who were eligible for dental services, only 26 percent had a dental service of some kind performed. One way publicly funded dental programs could become more accessible is if more dentists would treat low-income adolescents—reimbursement rates, program administration, and program structure appear to be barriers to dentists' participation in the Medicaid program.

Since the visit to a dentist is a primary locus for dental health education, low-income adolescents may have less access to dental health education than other adolescents. It is at least conceivable that increasing low-income adolescents' oral health awareness might spur their dental care-seeking behaviors, thereby improving their effective access to dental services.

Topical fluoride, sealants, prophylaxis (teeth cleaning by dental professionals), restorations, and space maintenance are the primary preventive or therapeutic treatments for most adolescents' dental problems (not including extraction). Unfortunately, not all publicly funded dental programs offer these primary services or the services are offered on a limited basis. Thus, many low-income adolescents lack access to certain dental treatments that could reduce or prevent their dental diseases.

Besides professional services, personal oral hygiene plays a significant role in dental health (e.g., personal plaque control can reverse gingivitis and self-application of fluoride can help prevent caries). Adolescents are held responsible for their personal hygiene behaviors, but it is not clear that they are provided with adequate information. The effectiveness of health education programs can be measured in terms of changes in attitudes or behaviors or, preferably, in terms of changes in the rate of disease.

Schools and dental offices and clinics are primary sites for dental health education. A central repository of dental health education materials—e.g., within the Public Health Service—could improve the likelihood of consistent information and improve the chances for coordinated educational activities.

Dentists should also be included in dental educational activities. To treat adolescents effectively, dentists probably could benefit from materials intended to make them more aware of adolescent-specific dental conditions (e.g., localized juvenile periodontitis) and adolescent-specific needs (e.g., for information on the effects of behaviors such as smokeless tobacco).

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PREVENTION AND SERVICES RELATED TO SEXUALLY TRANSMITTED DISEASES AND PREGNANCY

Chapter 9

AIDS AND OTHER SEXUALLY TRANSMITTED DISEASES: PREVENTION AND SERVICES

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Chapter 9

AIDS AND OTHER SEXUALLY TRANSMITTED DISEASES: PREVENTION AND SERVICES

Introduction

Within the past decade, acquired immunodeficiency syndrome (AIDS) has emerged as a major national health problem. Although human immunodeficiency virus (HIV)—the virus associated with AIDS—is transmitted from an infected individual to another individual through methods that include the sharing of intravenous (IV) drug needles, one of the primary routes is through sexual intercourse. For this reason, AIDS is often characterized as a sexually transmitted disease (STD) (242).[1] Individuals with some of the more traditional STDs (i.e., chancroid, herpes, and syphilis) may be especially vulnerable to HIV infection (52,106,164,165,234); and for that and other reasons, there has been an increasing awareness of STDs as problems in themselves.

Adolescents who engage in sexual intercourse or use IV drugs are at risk of infection with HIV or an STD.[2] Although through August 1990, cases of AIDS among adolescents ages 13 to 19[3] represented under 1 percent (568 cases) of all AIDS cases in the United States (237a), AIDS was the sixth leading cause of death[4] for 15- to 24-year-olds (110). Given the estimated 10-year incubation period between HIV infection and the onset of AIDS, it is probable that many of the young adults who currently have AIDS acquired HIV infection during adolescence. Limitations in STD reporting requirements mean that the number of U.S. adolescents with some STDs is unknown, but STDs other than AIDS have been characterized as being among the most pervasive and costly communicable diseases threatening adolescents today (121,227,261). Until recently, however, efforts to control HIV infection and STDs have not focused on adolescents (209).

The physical, emotional, and psychological complications of HIV infection or STDs can be severe. There is still no cure for HIV infection, and HIV-related illnesses are eventually fatal. Unlike AIDS, many STDs can be cured (e.g., the bacterial STD syphilis) or their symptoms can be substantially controlled (e.g., the viral STD herpes); if left untreated, though, STDs other than AIDS can have extremely serious consequences, including infertility, ectopic pregnancy,[5] gonococcal arthritis, and sometimes death. Because of their common predominantly sexual origin, this chapter explores AIDS and STDs in the adolescent population together, focusing on the extent of the problem, prevention efforts, and services and interventions for treatment. The chapter concludes by considering major Federal policies and programs directed toward adolescents.

Background on AIDS and Other STDs

Accurate reporting of cases of HIV infection, AIDS, and other STDs is important for determining the extent of infection among a particular population, for planning, implementing, and evaluating prevention and control activities, and for distributing Federal and other funds for HIV/AIDS and STD programs and treatment (28,41,229).

For reasons including those described in box 9-A, the precise number of adolescents with HIV infection and with many STDs is not known. The authority to require the reporting of communicable diseases by health professionals rests with the States, and State requirements with respect to the reporting by health care professionals of communi-

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[1] A *sexually transmitted disease*, formerly called venereal disease (36), is an infectious disease transmitted chiefly through sexual intercourse or genital contact.

[2] According to preliminary data from a 1989 survey by the Centers for Disease Control within the U.S. Department of Health and Human Services, 53 percent of the Nation's high school students have had intercourse (72a). For further discussion see ch. 10, "Pregnancy and Parenting: Prevention and Services" and ch. 12, "Alcohol, Tobacco and Drug Abuse: Prevention and Services," in this volume.

[3] The focus of this OTA report for reasons noted in Vol. I, and ch. 2 in this volume, is on 10- through 18-year-olds. Some of the data presented in this chapter are for other age groupings, because data for 10- through 18-year-olds are not readily available. For information about Federal agencies' data collection activities related to adolescents, see ch. 19, "The Role of Federal Agencies in Adolescent Health," in Vol. III.

[4] This ranking is based on 1987 data for AIDS deaths and 1986 data for deaths due to other causes.

[5] An *ectopic pregnancy* is a pregnancy that occurs somewhere in the body other than in the uterus.

Box 9-A—Limitations of Federal Data on the Prevalence and Incidence of HIV Infection, AIDS, and Other STDs Among U.S. Adolescents

Various Federal sources publish data on the prevalence and incidence of reported cases of HIV infection, AIDS, and other STDs.[1] The Centers for Disease Control (CDC) within the U.S. Department of Health and Human Services (DHHS), for example, publishes such data in its *Morbidity and Mortality Weekly Report* (e.g., 235), its "HIV/AIDS Surveillance" report (236,237), and in its *Sexually Transmitted Disease Statistics* report (241). Some of the data published by CDC are compilations of reported AIDS and STD cases from the States.

States have the authority to require health care professionals to report infectious diseases and to specify the conditions under which they are to be reported (e.g., the time for reporting, person responsible for reporting, and agencies to receive the reports) (5,41). Although CDC *recommends* that States report particular STDs (47), it does not have the authority to *require* States to report them (64,229). In the absence of a national reporting requirement, there is no uniformity in State reporting requirements for STDs. Currently, for example, all 50 States and the District of Columbia do require that health care professionals report AIDS cases to State health departments; but as of April 1990, only 32 States required that health care professionals report cases of HIV infection (65) (in July 1989 there were only 29 such States).[2] Similarly, while all 50 States do require that health care professionals report gonorrhea and syphilis, only 33 States require the reporting of chlamydial infections (41,229).

Even in those States that do require the reporting of certain communicable diseases reported in CDC's publications, data on STDs have several additional limitations. These are caused by incomplete reporting, by differences in reporting by public and private health sources, and by limitations in the specificity of diagnostic tests (17,125). In a number of States, including those with a high prevalence of HIV infection, there is evidence to suggest that AIDS cases may be underreported by as much as 20 percent (48,228). Reasons for undercounting of AIDS and other STDs are varied. One reason is that some individuals with STDs experience no symptoms and therefore do not seek a health evaluation or diagnosis (65). Other reasons include the lack of symptoms for some STDs, the use of differing criteria in diagnosing STDs, and the stigma associated with having an STD (133). Another problem is that because public health clinics tend to report STDs more completely than do private practitioners, biases are created by individuals attending public clinics (35).

In addition to providing compilations of reported AIDS and STD cases from the States, the Federal Government supports ongoing HIV seroprevalence surveys among national samples, such as the National Health and Nutrition Examination Survey, to monitor the spread of HIV infection and STDs (106,233). HIV seroprevalence surveys supported by the Federal Government focus on groups of individuals at risk of infection (e.g., homosexual and bisexual men, intravenous drug users), women in clinical settings and of childbearing age, college students, migrant and seasonal farmworkers, blood donors, military recruits, Job Corps entrants, and selected "sentinel" hospital patients (233). To avoid self-selection bias, some of the HIV seroprevalence surveys are conducted as anonymous surveys that cannot link individuals to HIV test results; other surveys interview survey participants to evaluate risk factors for HIV infection. Findings from HIV seroprevalence surveys supported by the Federal Government are generally not representative of the adolescent population. Some of these surveys (e.g., surveys from Job Corps residential entrants) probably overestimate the extent of HIV infection among adolescents, and others (e.g., surveys among military recruits) may underestimate the extent of such infection.

---

[1] *Incidence* is a measure of the number of new cases of a disease or other condition occurring in a population during a given period of time. *Prevalence* is a measure of the number of individuals in a given population who have a specific disease or other condition at a designated time (or during a particular period).

[2] Eighteen States require that people with HIV be reported by name. Ten of these States, however, do allow for anonymous testing in certain circumstances (229).

cable diseases vary by disease and by State (see table 9-1). All 50 States and the District of Columbia do require that health care professionals report AIDS cases to State health departments, and all 50 States require reporting of gonorrhea and syphilis; as of April 1990, only 32 States required that health care professionals report cases of HIV infection (65), and as of March 1, 1989, only 33 States required the reporting of chlamydial infections (41,229). Evidence from selected samples suggest that certain segments of the adolescent population may be at particular risk of HIV infection and STDs.

Table 9-1—State Reporting Requirements for Selected Communicable Diseases

State	Human immunodeficiency virus (HIV)[b]	Acquired immunodeficiency syndrome (AIDS)[b]	Sexually transmitted diseases (STDs)[a]							
			Chancroid	Chlamydial infections	Gonococcal disease	Herpes simplex	Nonspecific urethritis	Pelvic inflammatory disease	Unspecified	Syphilis
Alabama	X[c]	X	X	—	X	—	—	—	—	X
Alaska	—	X	X	—	X	—	—	—	—	X
Arizona	X[c]	X	—	X[e]	X	X[i]	—	—	—	X
Arkansas	X[c]	X	—	—	X	—	—	—	—	X
California	—	X	X	X	X	—	X	X[o]	—	X
Colorado	X[c]	X	X	—	X	—	—	X[p]	—	X
Connecticut	—	X	—	X	X	X[g]	—	—	—	X
Delaware	—	X	X	—	X	—	—	—	—	X
District of Columbia	—	X	X	X	X	—	—	—	—	X
Florida	—	X	X	—	X	—	—	—	—	X
Georgia	X[d]	X	—	X[f]	X	—	X	—	X	X
Hawaii	—	X	X	X	X	X[g]	X	X[o]	X	X
Idaho	X[c]	X	X	X	X	X[i]	—	—	—	X
Illinois	X[d]	X	—	X	X	—	—	—	—	X
Indiana	X[c]	X	X	X	X	X[g]	—	X[o]	—	X
Iowa	X[d]	X	—	X	X	—	—	—	X	X
Kansas	—	X	X	X	X	—	X	—	—	X
Kentucky	X[d]	X	X	X	X	X[i]	X	—	—	X
Louisiana	—	X	X	—	X	X[g]	—	—	—	X
Maine	X[d]	X	X	X	X	—	—	—	—	X
Maryland	—	X	X	—	X	—	—	—	—	X
Massachusetts	—	X	X	X	X	X[g]	—	X[o p]	—	X
Michigan	X[c]	X	X	—	X	—	—	—	—	X
Minnesota	X[c]	X	X	X	X	X[g]	X	—	—	X
Mississippi	X[c]	X	—	—	X	—	—	—	—	X
Missouri	X[c]	X	X	X	X	X[i]	X	—	—	X
Montana	X[d]	X	X	X	X	—	—	—	—	X
Nebraska	—	X	X	X	X	X[j]	—	—	—	X
Nevada	X[d]	X	X	X	X	—	—	X[o]	—	X
New Hampshire	—	X	—	X	X	X[k]	X	—	—	X
New Jersey	—	X	X	—	X	—	—	—	—	X
New Mexico	—	X	X	X	X	—	—	—	—	X
New York	—	X	X	—	X	—	—	—	—	X
North Carolina	—	X	X	X	X	—	X	—	—	X
North Dakota	X[c]	X	X	X	X	X[i]	—	—	—	X
Ohio	X	X	X	X	X	X[g k m]	X	—	—	X
Oklahoma	X[c]	X	—	X[g]	X	—	—	—	—	X
Oregon	X[d]	X	X	X	X	X[g]	—	X[q]	—	X
Pennsylvania	—	X	—	—	X	—	—	—	—	X
Rhode Island	X[d]	X	X	X	X	—	—	—	—	X
South Carolina	X[c]	X	X	—	X	X[i]	—	X[o]	—	X
South Dakota	X[c]	X	X	—	X	X[g i n]	—	—	X	X
Tennessee	—	X	—	X	X	—	X[m]	—	—	X
Texas	X[d]	X	—	X[h]	X	—	—	—	—	X
Utah	X[c]	X	X	—	X	—	—	—	—	X
Vermont	—	X	—	—	X	—	—	—	—	X
Virginia	X[c]	X	X	X	X	—	—	—	—	X

Continued on next page

Table 9-1—State Reporting Requirements for Selected Communicable Diseases—Continued

State	Human immunodeficiency virus (HIV)[b]	Acquired immunodeficiency syndrome (AIDS)[b]	Sexually transmitted diseases (STDs)[a]							
			Chancroid	Chlamydial infections	Gonococcal disease	Herpes simplex	Nonspecific urethritis	Pelvic inflammatory disease	Unspecified	Syphilis
Washington	—	X	X	X	X	X[g,j]	X	X[q]	—	X
West Virginia	—	X	X	—	X	—	—	—	—	X
Wisconsin	X[c]	X	X	X	X	X[j]	X	X	—	X
Wyoming	X[c]	X	X	X	X	X[i]	—	—	—	X

KEY: X = reporting required.
— = no reporting required.

[a] Current as of Mar. 1, 1989.
[b] Current as of July 1989.
[c] Reporting required with names.
[d] Reporting required without names.
[e] Reporting required for genital chlamydial infection.
[f] Reporting required for females.
[g] Congenital and newborn reporting required.
[h] Laboratory confirmed cases required to be reported.
[i] Reporting required for genital herpes simplex.
[j] Reporting required for primary episode of herpes simplex infection and for genital herpes simplex infection.
[k] Meningoencephalitis.
[l] Scromboid.
[m] Reporting required for number (or age and number) only.
[n] Optional.
[o] Unspecified.
[p] Gonococcal.
[q] Acute or newly diagnosed.

SOURCE: Office of Technology Assessment, 1991, based on the following sources: **HIV and AIDS data**: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, "HIV Reporting—United States," *Morbidity and Mortality Weekly Report* 38(28):496-499, July 21, 1989; (for Ohio) B. Kriss, Assistant with the STD Unit, Ohio Department of Health, Columbus, OH, personal communication, May 31, 1990. **STD data**: T.L. Chorba, R.L. Berkelman, S.K. Safford, et al., "Mandatory Reporting of Infectious Diseases by Clinicians," *Journal of the American Medical Association* 262(21):3018-3026, 1989.

Trends in the Prevalence and Incidence of HIV Infection and AIDS

HIV, the virus associated with AIDS, is transmitted chiefly from an infected person to another person through anal, vaginal, or oral sexual intercourse,[6] the sharing of IV needles, infected blood or blood products, and from an infected mother to her infant (233,235). The best estimate of the median interval between HIV infection and the onset of AIDS, which is characterized by a deficiency in the immune system, is approximately 10 years (233); the incubation period may vary depending on the route of HIV infection (90) and may be different for adolescents than for older individuals (81).

Prevalence and Incidence of AIDS

As noted earlier, AIDS is the sixth leading cause of death for U.S. adolescents and young adults between the ages of 15 and 24 (110),[7] and there are grounds for believing that it will remain in this position in the future (51). In order to have an accurate description of the extent to which and the method by which adolescents with AIDS have acquired HIV infection, it is important to examine the Center for Disease Control's (CDC) monthly "HIV/AIDS Surveillance" reports for data on 20- to 24-year-olds with AIDS and on 13- to 19-year-olds with AIDS. As of August 31, 1990, these data showed that adolescents ages 13 to 19 represented under 1 percent (568 cases) of all AIDS cases; when young adults ages 20 to 24 were included in the calculation, however, the number of AIDS cases rose to 6,740, or 4.6 percent of all AIDS cases (237a).

The method by which infected individuals transmit HIV to uninfected adolescents has relevance for the design, implementation, and targeting of appropriate services and behavioral interventions to adolescents (88). It is also important to consider the relevance of changing patterns in HIV transmission for future adolescents. In general, adolescents who currently have AIDS are less likely than adults ages 20 to 24 or adults over age 25 to have acquired HIV through male homosexual/bisexual contact or IV drug use; adolescents with AIDS are more likely than other individuals to have acquired HIV through the transfusion of contaminated blood and blood products for the treatment of hemophilia (see table 9-2). However, most observers expect that, with improvements in the safety of blood products used by hemophilia patients, adolescent males with hemophilia will no longer represent a large percentage of the adolescent male AIDS cases (90,267). Patterns such as those seen in New York City, where nonhemophilia cases predominate, are believed to be a better "crystal ball" for the Nation (90).

Still, among adolescents with AIDS, the transmission of HIV through sexual intercourse is an important route. For individuals ages 13 to 19, male homosexual/bisexual contact is the second most common route of HIV transmission (237). Furthermore, the percentage of 13- to 19-year-olds who have become infected with HIV through heterosexual intercourse (12 percent) exceeds the percentage of older adults who have become infected with HIV through heterosexual intercourse (5 percent) (234, 237,267). Transmission through heterosexual intercourse is particularly important as a route of HIV transmission for adolescent females. Forty-five percent of 13- to 18-year-old females with AIDS acquired HIV through heterosexual intercourse (255). In New York, where many adolescents with AIDS live, close to half of the adolescent female AIDS cases can be attributed to heterosexual spread, which is twice the adult female rate (88,267,290).

Another indication of the importance of heterosexual HIV transmission among adolescents is the male-to-female ratio of reported AIDS cases. For example, compared with the 10:1 male-to-female ratio for adults in the United States over age 25, the adolescent male-to-female ratio of 4:1 more closely resembles the 1:1 adult ratio in Africa, where the primary route of HIV transmission is through heterosexual intercourse (see figure 9-1) (165,237). Given the number of adolescents who engage in sexual intercourse, the higher proportion of heterosexual cases and the lower adolescent male-to-female ratio illustrate the need to include a variety of efforts for the prevention of HIV infection.

Most adolescent AIDS cases reported to date have occurred in urban areas (227). However, AIDS cases in rural and noncoastal areas are becoming increasingly common (77). Fifty-five percent of adolescent

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[6] The risk of HIV infection is greatest for individuals engaging in unprotected (i.e., without a condom) receptive anal intercourse with an infected partner; the risk is lower for those engaging in oral intercourse and for those engaging in vaginal and insertive anal intercourse (142).

[7] This ranking is based on 1987 data for AIDS deaths and 1986 data for death due to other causes. Rankings for other age groups are as follows: 27th for children under age 1, 9th for 1- to 4-year-olds, and 12th for 5- to 14-year-olds (110).

Table 9-2—Cumulative AIDS Cases Among Adolescents and Young Adults in the United States, by Exposure Category, 1981-90[a]

	Cumulative AIDS cases by age							
	13 to 19		20 to 24		≥ 25		Total[b]	
Exposure category	No.	%	No.	%	No.	%	No.	%
Male homosexual/bisexual contact	145	(28%)	3,254	(57%)	74,813	(60%)	78,212	(60%)
Intravenous (IV) drug use (female and heterosexual male)	59	(12)	903	(16)	26,880	(21)	27,842	(21)
Male homosexual/bisexual contact and IV drug use	23	(4)	534	(9)	8,391	(7)	8,948	(7)
Hemophilia/coagulation disorder	157	(31)	148	(3)	866	(1)	1,171	(1)
Heterosexual contact[c]	62	(12)	503	(9)	5,967	(5)	6,532	(5)
Receipt of blood transfusion, blood components, or tissue	38	(7)	86	(2)	2,995	(2)	3,119	(2)
Other/undetermined[d]	29	(6)	242	(4)	4,157[e]	(3)	4,428	(3)
Total[f]	513	(100%)	5,670	(100%)	124,069	(99%)	130,252	(100%)

[a] Current as of Apr. 30, 1990.

[b] Includes three patients infected with HIV type 2.

[c] This exposure category includes those individuals who have had sex with an IV drug user, a bisexual male, a person with hemophilia, an HIV-infected transfusion recipient, or an HIV-infected person whose risk is not determined. In addition, the category includes individuals who are recorded as heterosexual cases because they were born in areas of central, eastern, and southern Africa, which have distinctive patterns of transmission (i.e., most cases of AIDS occur in heterosexuals and the male-to-female ratio is approximately 1:1).

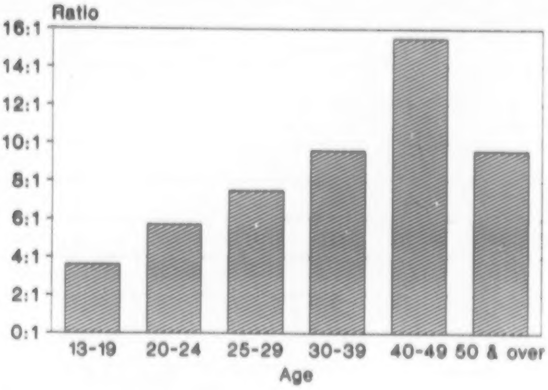
[d] Other refers to two health care workers over age 25 who developed AIDS through occupational exposure to HIV. Undetermined cases include those individuals whose mode of HIV transmission is not known (i.e., individuals whose exposure category is being investigated, those whose category remains undetermined after investigation, and those who either died, refused to be interviewed, or were not followed up).

[e] This figure includes two health care workers who developed AIDS after occupational exposure to HIV.

[f] Because of rounding, percentages may not total 100 percent.

SOURCE: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, Center for Infectious Diseases, Division of HIV/AIDS, "HIV/AIDS Surveillance," Atlanta, GA, May 1990.

Figure 9-1—Male-to-Female Ratio for Reported AIDS Cases in the United States, by Age of Diagnosis[a]



[a] Current as of Apr. 30, 1990.

SOURCE: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, Center for Infectious Diseases, Division of HIV/AIDS, "HIV/AIDS Surveillance," Atlanta, GA, May 1990.

AIDS cases have been reported from New York, California, Florida, New Jersey, Texas, and Puerto Rico (227).

Finally, black and Hispanic adolescents represent a disproportionate share of adolescent AIDS cases in relation to their numbers in the population (206,237). In fact, blacks make up a greater proportion of AIDS cases among adolescents than do blacks in other age groups (see table 9-3). Among adolescents, as among young and older adults, blacks make up a larger proportion of female AIDS cases than of male cases. Fifty-eight percent of the adolescent female AIDS cases are black, and 30 percent of adolescent male AIDS cases are black (237). The majority of AIDS cases among both black and Hispanic adolescents are transmitted through IV drugs or homosexual or heterosexual contact. For white adolescents, the primary mode of the transmission of AIDS is through blood product exposure (see figure 9-2) (253a).

Prevalence and Incidence of HIV Infection

The prevalence of HIV infection may give a more accurate indication of the potential AIDS problem within the adolescent population than does the count of reported AIDS cases. Most seroprevalence studies have relied on samples of convenience (see table 9-4), and few have included adolescents (91). Thus far, the largest samples have come from active duty military personnel, military recruits, and Job Corps entrants, groups which are not representative of the adolescent population. Data from the military indicate that adolescents ages 17 to 19 have relatively low rates of HIV infection (31,224,225), but data

Table 9-3—Cumulative AIDS Cases in the United States, by Age and Race/Ethnicity, 1981-90[a]

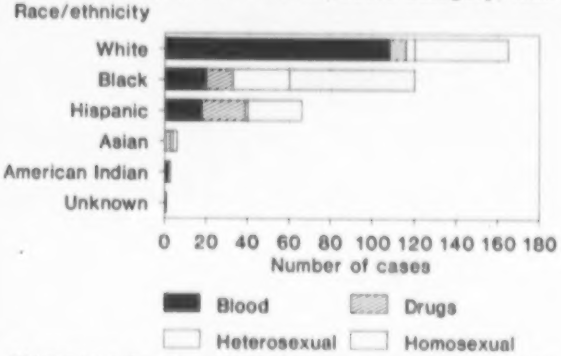
	Cumulative AIDS cases by age at diagnosis									
	13 to 19		20 to 24		25 to 29		>30		Total	
Race/ethnicity	No.	%	No.	%	No.	%	No.	%	No.	%
White, not Hispanic	246	(43%)	2,952	(48%)	12,433	(53%)	64,943	(57%)	80,574	(56%)
Black, not Hispanic	206	(36)	2,001	(32)	6,731	(29)	30,923	(27)	39,861	(28)
Hispanic	102	(18)	1,159	(19)	4,066	(17)	17,005	(15)	22,332	(16)
Asian/Pacific Islander	7	(1)	30	(0.5)	118	(0.5)	731	(1)	886	(1)
American Indian/Alaskan Native	6	(1)	15	(0.2)	42	(0.2)	142	(0.1)	205	(0.1)
Total[b]	568	(100%)	6,172	(100%)	23,437	(100%)	114,044	(100%)	144,221	(100%)

[a] Current as of Aug. 30, 1990.

[b] Includes 363 persons whose race/ethnicity is unknown.

SOURCE: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, Center for Infectious Diseases, Division of HIV/AIDS, "HIV/AIDS Surveillance," Atlanta, GA, September 1990.

Figure 9-2—AIDS Cases Among U.S. Adolescents Ages 13 to 19, by Race and Exposure Category, 1988



SOURCE: U.S. Department of Health and Human Services, Public Health Service, Health Resources and Services Administration, Bureau of Maternal and Child Health and Resources Development, Office of Maternal and Child Health, *Child Health Day USA, '89*, DHHS Pub. No. HRS-MCH8915 (Rockville, MD: October 1989).

from Job Corps entrants (who are primarily economically disadvantaged 16- to 21-year-olds) suggest that these adolescents and young adults have a greater risk of HIV infection, though still a relatively low risk (228). Among military recruits ages 17 and 18, the male-to-female HIV prevalence ratio is 0.9:1 (31).

Data from smaller samples suggest that certain groups of adolescents, including runaway and homeless adolescents attending STD clinics, may have an appreciable risk of HIV infection (30,164,192,192a, 224,225,233,267).[8] Among runaway and homeless adolescents age 18 staying at the Covenant House in New York, for example, 3.4 percent tested positive for HIV (192a).[9] Survey data from anonymously screened patients at Baltimore STD clinics show that HIV seroprevalence rates for adolescents ages 15 to 19 were relatively high and nearly equal for males and females (2.5 and 2 percent, respectively) (165).

HIV prevalence rates among adolescents vary by race, and blacks bear a disproportionate share of HIV cases. Even among male military recruits, who appear to have a relatively low risk of infection, black male recruits ages 17 and 18 were more than four times as likely to be HIV infected as white male recruits (31). Additionally, data from the Job Corps show that black adolescents ages 16 to 18 have a male-to-female ratio for HIV infection of approximately 1:1, suggesting an important role for heterosexual transmission among economically disadvantaged black adolescents (190).

For adolescents of all races combined, HIV seroprevalence rates are higher in the Northeast and South than in other regions of the country (190). For white adolescents, however, rates are highest in the West (190). Screening data from 1985-87 military recruits, 82 percent of whom were under age 25, suggest that HIV is increasingly spreading to low prevalence areas, particularly among young black males (77).

Trends in the Prevalence and Incidence of STDs

Sexually active adolescents are at risk for contracting all types of STDs (see table 9-5), but because of variable State reporting (see table 9-1)

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[8] For a general discussion of the health problems of runaway and homeless adolescents, see ch. 14, "Homelessness: Prevention and Services," in this volume.

[9] During the period October 1987 to December 1989, about 2 percent of 15- to 16-year-olds, about 3 percent of 17-year-olds, and 7.4 percent of 19- to 20-year-olds tested positive for HIV in this sample (192a).

Table 9-4—Selected Studies of Human Immunodeficiency Virus (HIV) Seroprevalence Involving Adolescent Groups

Group	Date of data collected	Age (years)	Percent HIV positive	Number tested
Active duty military personnel	1/87-4/88	17-19	0.0[illegible]%	322,506
		20-24	0.1[illegible]	568,920
		25-29	0.21	366,156
Civilian applicants for military service	10/15/85-3/31/89	< 20	0.03%	1,141,164
		17-18 males	0.02	763,872
		17-18 females	0.03	112,604
		< 20 black	0.10	215,869
		< 20 white	0.02	837,544
		< 20 Hispanic	0.03	55,630
Job Corps residential entrants	3/87-5/89	16-21	0.41%	84,089
College students[a]	NA	College age	0.2%	12,000
Mothers of newborns screened in New York	11/30/87-11/30/88	< 20 upstate New York	0.13%	12,344
		20-29 upstate New York	0.17	83,055
		< 20 New York City	0.72	17,871
		20-29 New York City	1.3	67,818
Incarcerated youth in Los Angeles County	2/87-8/87	16-17	0.2%	1,878
Runaway and homeless youth in Covenant House, New York City	10/87-12/89	15-16	2.2%	312
		17	2.9	340
		18	3.4	591
		19-20	7.4	1,403
Sexually transmitted disease (STD) clinic patients	2/2/87-4/30/87	15-19 females	2.5%	434
		15-19 males	2.0	509
		20-24 females	3.4	385
		20-24 males	3.8	840
		25-29 females	2.9	239
		25-29 males	6.9	598
Adolescents in an adolescent clinic in Washington, DC	10/87-1/89	13-18	0.37%[b]	3,520
		13-15	0.11	
		15-18	0.69	

KEY: NA = not available.

[a] Majority of cases come from males.

[b] This represents only 46 percent of all positive adolescents seen during the 15-month study interval.

SOURCE: Office of Technology Assessment, 1991, based on the following sources: **Active-duty military personnel:** U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, "Prevalence of Human Immunodeficiency Virus Antibody in U.S. Active Duty-Military Personnel, April 1988," *Morbidity and Mortality Weekly Report* 37(30):461-463, Aug. 5, 1988. **Civilian applicants:** D.S. Burke, J.F. Brundage, M. Goldenbaum, et al., "Human Immunodeficiency Virus Infections in Teenagers: Seroprevalence Among Applicants for U.S. Military Service," *Journal of the American Medical Association* 263(15):2074-2077, 1990. **Job Corps, college students, incarcerated youth:** U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, Center for Infectious Diseases, "AIDS and Human Immunodeficiency Virus Infection in the United States: 1988 Update," *Morbidity and Mortality Weekly Report* 38(S-4):1-38, May 12, 1989. **Mothers of newborns:** L.F. Novick, D. Berns, R. Stricof, et al., "HIV Seroprevalence in Newborns in New York State," *Journal of the American Medical Association* 261(12):1745-1750, 1989. **Runaway and homeless youth:** R. Stricof, J. Kennedy, T.C. Nattell, et al., "HIV Seroprevalence of Adolescents in a Facility for Runaway and Homeless Adolescents," *American Journal of Public Health* 81(Supplement):50-53, 1991. **STD clinic patients:** T.C. Quinn, D. Glasser, R.O. Cannon, et al., "Human Immunodeficiency Virus Infection Among Patients Attending Clinics for Sexually Transmitted Diseases," *New England Journal of Medicine* 318(4):197-203, 1988. **Adolescent clinic patients:** L. D'Angelo, P. Getson, N. Luban, et al., "HIV Infection in Adolescents: Can We Predict Who Is at Risk," poster presentation at the Fifth International Conference on AIDS, "The Scientific and Social Challenge," Montreal, Quebec, Canada, June 4-9, 1989.

and the reticence of private physicians to report STDs,[10] it is impossible to estimate national incidence and prevalence rates for STDs other than gonorrhea and syphilis. STD surveys are similar to HIV seroprevalence studies in that they are typically based on small samples of convenience (see table 9-6). Still, the available data indicate that chlamydia infection and other STDs are much more common in

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[10] Less than 20 percent of STD reports come from private physicians; approximately 80 percent come from public STD clinics (82). Two-thirds of gonorrhea cases are reported from public health clinics (241). Younger adolescents ages 10 to 14 of both sexes and older female adolescents ages 15 to 19 have approximately the same ratio of case reporting from public and private facilities.

Table 9-5—Overview of Selected Sexually Transmitted Diseases and Syndromes

Agent	Disease or syndrome	Typical presenting signs and symptoms	Examples of potential complications/ sequelae
Bacterial Agents:			
Neisseria gonorrhoeae	Gonorrhea	Abnormal vaginal or penile discharge, abdominal pain; may be asymptomatic	Disseminated gonococcal infection (e.g., septicemia), PID, infertility, epididymitis
Gardnerella vaginalis	Nonspecific vaginitis	Vaginal inflammation, abnormal discharge; may be asymptomatic	Recurrent infection
Chlamydia trachomatis	Chlamydial infections:		
	Nongonococcal urethritis	Dysuria, urinary frequency, abnormal penile discharge; may be asymptomatic	Urethral stricture, prostatitis, epididymitis
	Mucopurulent cervicitis	Abnormal endocervical discharge; may be asymptomatic	Endometritis, salpingitis, infertility, adverse obstetric outcomes
Treponema pallidum	Primary syphilis	Chancre	Late (tertiary) syphilis and sequelae, neurosyphilis
	Secondary syphilis	Skin rash, mucous patches, lymphadenopathy, condyloma lata	
Hemophilus ducreyi	Chancroid	Genital ulceration, often painful, accompanied by adenopathy	Secondary infections of lesions, phimosis
Shigella sp.	Shigellosis	Diarrhea, tenesmus, abdominal cramping	Rectal prolapse, dysentery
Viral Agents:			
Herpes simplex virus (HSV) 1	Nongenital herpes	Blisters on eyes or other facial regions	Aseptic meningitis, recurrent HSV infection
Herpes simplex virus (HSV) 2	Genital herpes	Blisters, genital ulcers, stomatitis, and oral lesions	Disseminated infection, recurrent HSV infection
Human papillomavirus (HPV)	Condyloma acuminatum	Warty lesions in genital or anal area	Genital dysplasia, carcinoma
Hepatitis B virus	Hepatitis	Malaise, jaundice, vomiting; may be asymptomatic	Cirrhosis, liver failure, arthritis, death
Cytomegalovirus	Heterophil negative mononucleosis	Malaise, lymphadenopathy	Congenital cytomegalic inclusion disease
Human immunodeficiency virus (HIV)	HIV infection	Generalized lymphadenopathy, weight loss, night sweats, intermittent fever, malaise, diarrhea; may initially be asymptomatic	Full-blown AIDS
	Acquired immunodeficiency syndrome (AIDS)	Symptoms of opportunistic infections such as pneumocystic pneumonia, or kaposi's sarcoma	Death
Mycoplasmal Agents:			
Ureaplasma urealyticum	Nongonococcal urethritis	Dysuria, urinary frequency, abnormal penile discharge; may be asymptomatic	Urethral stricture, prostatitis, epididymitis
Protozoa:			
Trichomonas vaginalis	Trichomoniasis	Vaginal inflammation, abnormal discharge, nongonococcal urethritis; may be asymptomatic	
Fungi:			
Candida albicans	Genital candidiasis	Vaginal inflammation, abnormal discharge, vulval inflammation; may be asymptomatic	Secondary excoriations, recurrent candidiasis

SOURCE: Office of Technology Assessment, 1991, based on U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, "Sexually Transmitted Disease Summary: 1990," Atlanta, GA, June 1990.

Table 9-6—Selected Studies Demonstrating Prevalence Rates of Sexually Transmitted Diseases (STDs) Among U.S. Adolescents

Study[a]	Population	Age	Location	Number tested	STD and percent of study group infected: Gonorrhea *(Neisseria gonorrhoeae)*	Chlamydia *(Chlamydia trachomatis)*	Trichomaniasis *(Trichomonas vaginalis)*	Other STD
Alexander-Rodriguez and Vermund, 1987	Adolescent male and female entrants into the New York City Juvenile Detention Center	9-18	New York City, NY	2,521	4.8% (males:3.0%; females:18.3%)	—	—	Syphilis (*Treponema pallidum*): 0.83% males: 0.63%; females: 2.5%)
Bell, Farrow, Stamm, et al., 1985	Female detainees in a juvenile detention center	12-18	Seattle, WA	100	18%	20%	48%	Bacterial vaginosis[d]: 25%
Chacko and Lovchik, 1984	Urban sexually active young males and females		Baltimore, MD	280	3%	22%	16%	—
D'Angelo, Mohla, Sneed, et al., 1987	Adolescents seen in the Adolescent and Young Adult Clinic of the Children's National Medical Center	—	Washington, DC	567	18.5%	—	—	—
Eager, Beach, Davidson, et al., 1985	Sexually active females attending three ethnically diverse urban Department of Health and Hospitals adolescent clinics[b]	12-18	Denver, CO	396	7% (blacks:16%; Hispanics:4%; whites:2%)	21% (blacks:28%; Hispanics:23%; whites:14%)	5% (blacks:20%; Hispanics:2%; whites:1%)	—
Fraser, Rettig, and Kaplan, 1983	Indigent girls		Oklahoma City, OK	125	3.8%	15.3%	—	—
Hardy, Hardy, Nell, et al., 1984	Low-income pregnant, predominantly black, females receiving prenatal care in the Johns Hopkins Adolescent Pregnancy Program	13-17	Baltimore, MD	115	10.4%	37%	34%	Candidiasis (*Candida albicans*): 38%; *Mycoplasma hominis*: 70%; *Ureaplasma urealyticum*: 90%
Jaffe, Siqueria, Diamond, et al., 1986	Low-income sexually active black and Hispanic females attending the Adolescent Health Center of Mount Sinai Hospital	14-20	New York City, NY	95	8.4%	26.3% (blacks:28.6%; Hispanics: 24.1%)	—	—
Johnson, Nahmias, Magder, et al., 1989	Participants in the National Health and Nutrition Examination Survey	1-74	United States	4,201	—	—	—	Herpes (Herpes simplex virus type 2): <1% under age 14
Martinez, Smith, Farmer, et al., 1988	Sexually active adolescent females, who are primarily black and from low-income communities, attending an adolescent clinic of the University of Maryland Hospital	13-19	Baltimore, MD	89	—	—	—	Condyloma acuminatum (Human papillomavirus): 13%

Table 9-6—Selected Studies Demonstrating Prevalence Rates of Sexually Transmitted Diseases (STDs) Among U.S. Adolescents—Continued

					STD and percent of study group infected			
Study[a]	Population	Age	Location	Number tested	Gonorrhea *(Neisseria gonorrhoeae)*	Chlamydia *(Chlamydia trachomatis)*	Trichomaniasis *(Trichomonas vaginalis)*	Other STD
Neinstein and Rabinovitz, 1988	All adolescents having a chlamydia culture at the Teenage Health Center at Children's Hospital	12-21	Los Angeles, CA	184	6.5%	20.1%	—	—
Oh, Feinstein, Soileau, et al., 1989	Inner-city low-income adolescent females seeking contraceptive counseling at the Teen Accent Clinic	12-18	Birmingham, AL	376	6.8%	19.4%	—	Trichomoniasis (*Trichomonas vaginalis*): 13.6%; Herpes (Herpes simplex virus): 1.1%
Saltz, Linnemann, Brookman, et al., 1981	Low- and middle-income sexually active adolescent females from urban areas attending the Adolescent Clinic of the Children's Hospital Medical Center	—	Cincinnati, OH	100	3%	22%	16%	Candidiasis (*Candida albicans*): 26%; Group B streptococci: 6%
Shafer, Beck, Blain, et al., 1984	Sexually active adolescent females from working class and impoverished inner-city families attending the University Hospital Teen Clinic or the San Francisco General Teen Family Planning Clinic	13-21	San Francisco, CA	366	3.8% (blacks:7.8%; Hispanics:1.4%; whites:2.1%)	15.3% (blacks:23.3%; whites:10.3%)	8% (blacks:13.6%; Hispanics:2.9%; whites:8.0%)	—
Shafer, Schachter, Moscicki, et al., 1989	Sexually active asymptomatic adolescent males attending teen and detention clinics[c]	13-19	San Francisco, CA	948	9%	3%	—	—

KEY: — = no data provided; s = significant difference.

[a] Full citations are listed at the end of this chapter.

[b] Two of the clinics served primarly low-income black and Hispanic adolescents. The third clinic served primarily white adolescents from low- to middle-income families.

[c] Teen clinics included a university and health maintenance organization-based adolescent clinic. The detention clinic was a general clinic for incarcerated adolescents. Excluded from the study were adolescent males who had symptoms of urethritis, had taken antibiotics within the past 3 weeks, had a systemic disease, or identified themselves as homosexual.

[d] This includes multiple organisms.

SOURCE: Office of Technology Assessment, 1991.

the adolescent population than HIV infection is. In fact, if the number of sexually active adolescents is used as the denominator in calculating rates instead of the entire adolescent population, overall STD prevalence rates are even higher (88).

In general, STD rates appear to vary by sex and race, there being more STDs reported among adolescent females than males and more among nonwhites than among whites (86,194,201,240). The overrepresentation of females may be explained in part by the fact that sexually active females seeking family planning services are frequently screened for common sexually transmitted infections regardless of the presence or absence of symptoms (10). Sexually active male adolescents have no such formal access to reproductive health care. The high reported STD rates among black and Hispanic adolescents may reflect the tendency of these adolescents, who are disproportionately of low socioeconomic status, to use public health clinics, which report STDs more completely than do private practitioners (17,125,287). An additional reason may be the higher rate of sexual intercourse among black adolescents (145).[11]

Prevalence and Incidence of Chlamydia Infection

The bacterium *Chlamydia trachomatis* is the agent that causes chlamydia infection, the most common type of STD infection among adolescents (9,55,176,180,182,201). Infected individuals, especially females, often experience no symptoms or signs of chlamydia infection (240). It is important to note, however, that chlamydia infection can lead to pelvic inflammatory disease (PID) in females and epididymitis[12] in males (36), both of which may result in involuntary infertility.

Although national surveillance of chlamydia infection is based on pilot projects (35), data from selected studies of adolescent females attending various types of clinics (i.e., STD clinics, juvenile detention clinics, and adolescent clinics) suggest that chlamydia infection appears to be highly prevalent among certain subgroups of sexually active adolescents, particularly among black inner-city adolescents from low socioeconomic backgrounds (see table 9-6) (15,67,103,151,176,180,181, 182,240). This observation may reflect the fact that many STD clinics are located in large metropolitan areas.[13] Chlamydia infection rates vary from 3 to 37 percent depending on the surveyed population. One study of ethnically diverse sexually active females ages 12 to 18 attending three urban adolescent health clinics in Denver found significant differences among black (28 percent), Hispanic (23 percent), and white (14 percent) adolescents' rates of chlamydia infection (67).

Prevalence and Incidence of Gonorrhea

The bacterium *Neisseria gonorrhoeae* is the agent that causes gonorrhea, the second most common STD among adolescents (55). As table 9-6 shows, female adolescents who attend health clinics and juvenile detention centers and are from racial or ethnic minority groups may be at particular risk of *Neisseria gonorrhoeae* infection, with prevalence rates ranging from 3 to 18 percent (4,15,39,54,67,73, 103,129,149,151,176,180,181). Black adolescent females ages 13 to 21 who attended a teen and family planning clinic in San Francisco were more likely to test positive for *Neisseria gonorrhoeae* (7.8 percent) than either their white (2.1 percent) or Hispanic (1.4 percent) peers (85,180).

Because reporting of gonorrhea cases is required in all 50 States (see table 9-1), a more reliable indicator of the extent to which *Neisseria gonorrhoeae* has occurred in the adolescent population may be the number of reported gonorrhea cases among adolescents (239) (see figure 9-3).

In 1989, the most recent year for which data on gonorrhea rates are available, the incidence of gonorrhea in adolescents ages 10 to 14 was 69.7 cases per 100,000 (equal to 11,820 cases) and the incidence rate in adolescents ages 15 to 19 was 1,145.4 cases per 100,000 (204,023 cases) (13a). Adolescents ages 10 to 19 accounted for 29.4 percent of newly reported gonorrhea cases in 1989 (13a). Although various factors may make year-by-year comparisons unreliable, it is disturbing to note that the incidence rate of gonorrhea jumped 63 percent among 10- to 14-year-olds between 1987 and 1989. Gonorrhea incidence rates have hovered around 1,200 cases per 100,000 adolescents for

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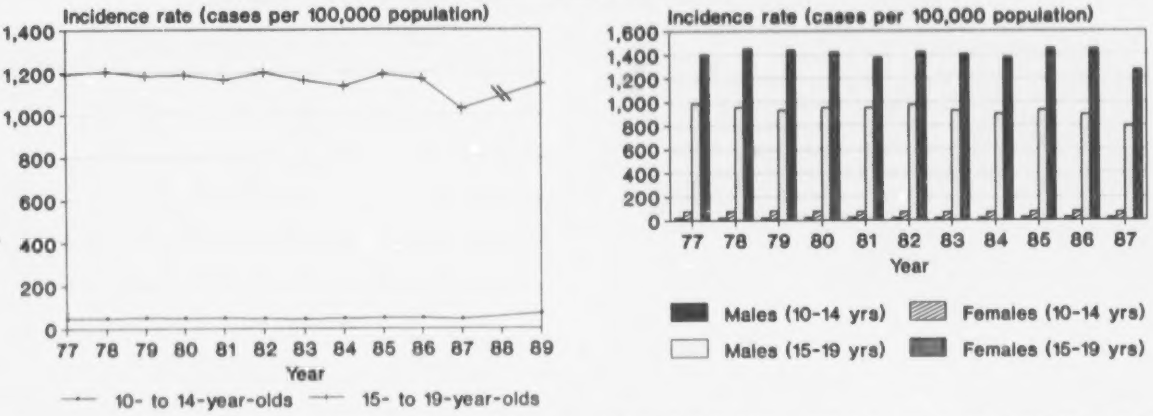
[11] Adolescents' sexual activity rates are discussed in ch. 10, "Pregnancy and Parenting: Prevention and Services," in this volume.

[12] *Pelvic inflammatory disease* is the inflammation of any female pelvic organ. *Epididymitis* is the inflammation of the epididymis.

[13] In some cases, individuals from smaller communities attend these clinics because they perceive them as offering better services and greater confidentiality (122).

Figure 9-3—Gonorrhea Incidence Rates Among U.S. Adolescents, 1977-89



Gonorrhea Incidence Rates for 10- to 19-Year-Olds, 1977-89

Gonorrhea Incidence Rates for 10- to 19-Year-Olds by Sex, 1977-87[a]

[a]Note incidence rates by sex were not available for 1988 and 1989 as this report was being written.

SOURCES: F. Barnes, Education Specialist, Center for Prevention Services, Centers for Disease Control, personal communication, Atlanta, GA, Feb. 28, 1991. U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, Center for Prevention Services, Division of Sexually Transmitted Diseases, *Sexually Transmitted Disease Statistics: 1987*, Issue No. 146 (Atlanta, GA: October 1988); and U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, Center for Prevention Services, Division of Sexually Transmitted Diseases, *Sexually Transmitted Disease Statistics: 1985*, Issue No. 145 (Atlanta, GA: August 1987).

15- to 19-year-olds. There are marked differences in rates of reported cases by sex. The reported gonorrhea incidence rate is higher in adolescent females than in adolescent males. For females ages 10 to 14, the rate in 1989 was over three times that of males, and for females ages 15 to 19, the rate was approximately 1.5 times that of males (see figure 9-3).[14] It is important to note that, if the proportion of sexually active adolescents were to be used as the denominator, the gonorrhea rates would be higher (90). The proportion of sexually active 10- to 14-year-olds is unknown.

Prevalence and Incidence of Condyloma Acuminatum

Human papillomavirus (HPV), which often results in condyloma acuminatum (exophytic warty lesions) has also been associated with cervical and anal cancer. As shown for other STD agents, the prevalence of HPV may be high within certain adolescent subgroups. For example, data from a small, selected sample of predominantly black adolescent females attending a Baltimore adolescent clinic indicate that 13 percent were infected with HPV (129).

Prevalence and Incidence of Herpes

Herpes simplex virus (HSV) causes herpes, usually producing small, sometimes painful blisters on the skin or mucous areas of the body. HSV 1 infections are usually nongenital (e.g., herpes labialis); HSV 2 infections are usually limited to the genital region (e.g., herpes genitalis). Few adolescents have tested positive for HSV infection. According to results from the National Health and Nutrition Examination Survey conducted between 1976 and 1980 (NHANES II), for example, less than 1 percent of adolescents under age 15 were infected with HSV 2 (106). Because of the large number of subclinical infections and because symptoms occur in less than 40 percent of HSV infections detected serologically (106), however, these rates may underestimate the extent of infection within the adolescent population.

Prevalence and Incidence of Syphilis

Syphilis is caused by the bacterial organism *Treponema pallidum*. The first two stages of the infection, primary and secondary syphilis, are followed by a period of latency. Without treatment, some individuals may eventually develop tertiary syphilis. Because tertiary syphilis usually takes many years to develop, individuals between the ages of 10 and 18 are not likely to develop this stage of infection during adolescence.

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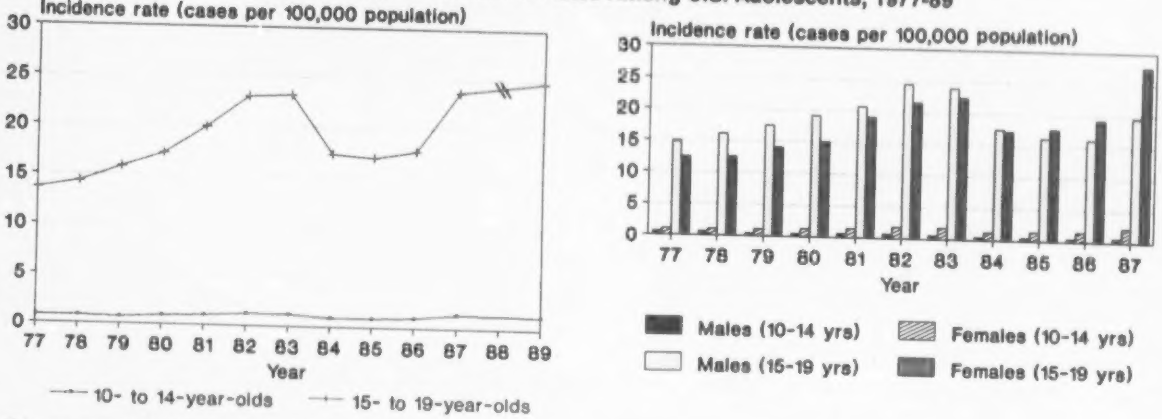
[14] The data provided by CDC are not broken down by race and age.

Figure 9-4—Syphilis Incidence Rates Among U.S. Adolescents, 1977-89



Primary and Secondary Syphilis Incidence Rates for 10- to 19-Year-Olds, 1977-89

Primary and Secondary Syphilis Incidence Rates for 10- to 19-Year-Olds by Sex, 1977-87[a]

[a]Note incidence rates by sex were not available for 1988 and 1989 as this Report was being written.

SOURCES: F. Barnes, Education Specialist, Center for Prevention Services, Centers for Disease Control, personal communication, Atlanta, GA, Feb. 28, 1991. U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, Center for Prevention Services, Division of Sexually Transmitted Diseases, *Sexually Transmitted Disease Statistics: 1987,* Issue No. 146 (Atlanta, GA: October 1988); and U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, Center for Prevention Services, Division ofSexually Transmitted Diseases, *Sexually Transmitted Disease Statistics: 1985,* Issue No. 145 (Atlanta, GA: August 1987).

Primary and secondary syphilis incidence rates among adolescents ages 15 to 19 in the 50 States have increased substantially since 1977 (see figure 9-4).[15] For all age groups (including adolescents), the increases appear to be largely among heterosexuals and among individuals living in California, Florida, and New York City (220).[16] For 10- to 14-year-olds, the 1987 syphilis prevalence rate of 1.4 cases per 100,000 population was the highest reported in over 30 years and represents a 75-percent increase from 1977; the 1989 rate was 1.27 per 100,000 (13a). For 15- to 19-year-olds, the 1987 rate (23.7 per 100,000) was the highest since 1965 (220,240); the 1989 rate was 24.74 per 100,000. Most of the increase in syphilis morbidity is accounted for by the large increase in the reported rate among female adolescents. Between 1977 and 1987, the incidence rate for adolescent females ages 10 to 14 and 15 to 19 increased approximately 120 percent, while the syphilis prevalence rate for 10- to 14-year-old males stayed almost constant, and the rate for 15- to 19-year-old males increased 33 percent (see figure 9-4) (240).

Prevalence and Incidence of Chancroid

Chancroid is a highly contagious, local ulcer caused by infection with the bacterium *Haemophilus ducreyi*. Internationally, chancroid is more common than syphilis (for all ages combined) (42). With just under 5,000 cases reported in 1987, chancroid is currently uncommon in the United States (125,240). Cases have been reported in 23 States with the highest rates reported in New York, Florida, and Georgia (240). The proportion of adolescents currently infected with chancroid is not known, and accurate reports are difficult to obtain (179).

Prevalence and Incidence of Pelvic Inflammatory Disease (PID)

PID is caused by *Neisseria gonorrhoea, Chlamydia trachomatis*,[17] and other organisms and is the most common consequence of STD infection for women (29,221,240,270,276). Forty-three percent of women hospitalized with PID are under age 25 (240). Between 1975 and 1981 approximately 16 percent of over 260,000 women ages 15 to 44 experiencing an episode of PID were between the ages of 15 and 19 (271). In general, black adolescent females are reported to have received treatment for PID more frequently than are whites (240,271). The reason for this is unclear. It may be that socioeconomic status accounts for the difference in incidence and thus treatment episodes; for example, white females, or middle-class females in general, could be misdiagnosed or given a different diagnosis because of the social stigma attending an STD (90).

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[15] The CDC data are not broken down by race and age. Among Native Americans of all ages (including adolescents) in eight reservation States, the primary and secondary syphilis rate was 26.5 per 100,000 in 1985, more than three times the overall rate (7.1 per 100,000) for those States. The U.S. incidence rate for primary and secondary syphilis was 11.4 per 100,000 (101).

[16] The cities with the highest rates are Atlanta, Miami, Tampa, Memphis, Washington, DC, and New York City (241).

[17] Approximately 40 percent of all PID cases in the United States are caused by *Chlamydia trachomatis* (240).

Factors Associated With HIV and STDs

All STD agents and HIV can be transmitted from an infected person to another partner through sexual intercourse—oral, anal, or vaginal (149,175,211, 223).[18] Increasingly, HIV infections have been linked with the sharing of contaminated needles used to inject illicit drugs and intercourse between infected IV drug users and their sexual partners (233,235,242). The use of crack cocaine, because of its association with increased levels of sexual intercourse, is thought to have contributed to enhanced HIV and STD levels in a number of States, such as New York, New Jersey, and Georgia (154).

The adolescent population is heterogeneous, and the risk of HIV infection and STDs varies for different groups of adolescents (89). For adolescents who have not had sexual intercourse at all or who have had few partners, and who do not use IV drugs, the risk of HIV or STD infection is low. At higher risk are adolescents who do one or more of the following:

- engage in sexual intercourse at early ages (136, 153);
- engage in unprotected anal intercourse;
- engage in male-to-male sexual relations (167);
- have several sexual partners (234);
- have sex with IV drug users;
- do not use condoms during sexual intercourse (222,234);
- use drugs that can be administered intravenously, such as cocaine, amphetamines, steroids, and heroin (88,144,168,212,214,227).

Statistically, members of racial and ethnic minority groups with low socioeconomic status may be at particular risk of both HIV infection and STDs (234).

Sexual and Drug-Using Behaviors[19]

Some adolescents engage in sexual or drug-using behaviors that put them at risk for HIV infection or STDs.

Sexual Behavior—By age 18, 47 percent of adolescent females and 65 percent of adolescent males have engaged in sexual intercourse (127); furthermore, data from California, Michigan, and San Francisco suggest that between 16 and 35 percent of adolescents in those areas have had intercourse before age 15 (33,226). Black adolescents are more likely than whites and Hispanics to report having had sexual intercourse (96,127, 139,140,185,284). This holds true at every age.

Although some adolescents do not have sexual intercourse until after age 18, some adolescents engage in risky sexual behaviors that increase their chances of infection. Data on particularly risky sexual behaviors, such as anal intercourse, are very sparse for adolescents. Two studies with very small samples, however, do suggest reason for concern. One study, by Goodman and Cohall, found that 8 percent of sexually active racial and ethnic minority adolescents attending a comprehensive clinic in a New York City public high school reported participation in anal intercourse (83). It is not clear from this study whether condoms were used during anal intercourse. Jaffe and colleagues reported that 26 percent of adolescent females in a clinic population had had anal intercourse (102).

The most effective way to prevent the transmission of HIV and other STD agents is to abstain from sexual intercourse. For individuals who do engage in sexual intercourse, however, the most effective way to prevent transmission is to prevent the exchange of blood, semen, or vaginal fluid. Various studies among adults found that the use of latex condoms lubricated with nonoxynol-9 is effective in lowering, but not eliminating, the risk of STD and HIV infection (46,69,74,107,172,222,234). The actual effectiveness of condoms in preventing transmission of HIV infection and STDs among adolescents is not known (273), because most data collected on adolescent condom use are from studies that have investigated condom use as a method of contraception and not as a method of protection from STDs.[20]

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[18] In addition, HIV and most STD agents can be passed perinatally from mother to child (233,234,235).

[19] For a discussion of adolescents' sexual practices, see ch. 10, "Pregnancy and Parenting: Prevention and Services." For a discussion of the use of drugs by adolescents, see ch. 12, "Alcohol, Tobacco, and Drug Abuse: Prevention and Services," also in this volume.

Most adolescents do not use any method of contraception at first intercourse (45,195,288), and they often delay contraceptive use up to a year after they have become sexually active (285,288). Among adolescents who do use contraception at first intercourse, however, condoms are one of the most commonly used methods of contraception (161,185, 195,285,288).[21] For adolescents who use condoms, there appear to be important racial, ethnic, and age differences. One study found that white adolescent females are more likely than either black or Hispanic adolescent females to have intercourse with partners who use condoms (195). Another study among a small, selected sample of sexually active inner-city black and Hispanic adolescent females found that some of these adolescents were less likely to use condoms during anal intercourse than during vaginal intercourse, although anal intercourse is believed to be more risky than either oral or vaginal intercourse in transmitting HIV (102). A study in Minnesota found that 9th graders were significantly less likely than 12th graders to use condoms (138).

Drug Use—As a group, adolescents are less likely to engage in drug-using behaviors that put them at risk for HIV and STDs than they are to engage in sexual behaviors that put them at risk. In recent statewide surveys in Massachusetts, for example, only 0.1 percent of adolescents reported engaging in IV drug use (95). Nevertheless, there are some adolescents who do use IV drugs and probably share IV needles, who exchange sex for drugs, or engage in sexual intercourse without condoms because of drug- or alcohol-induced disinhibitions and loss of judgment. Adolescents at highest risk may be adolescents who have been abused,[22] adolescents who are homeless or runaways,[23] adolescents who have engaged in prostitution, and adolescents who have been locked up in a juvenile detention facility[24] (4,57,152,167,192,250). One Texas study found that 7 percent of 213 runaways ages 11 to 16 reported injecting illicit drugs (98). However, surveys of high school students by CDC have found considerable geographic variation in IV drug use (226,231).

Although the use of drugs such as heroin among adolescents is not widespread, the use of alcohol and some other drugs is more prevalent and may, in fact, encourage risky sexual behavior that results in the transmission of HIV and STDs (35).[25]

Lack of Information

In general, American adolescents have a fairly high level of factual knowledge regarding HIV transmission and methods of preventing its transmission (226). Data from the 1987 National Adolescent Student Health Survey suggest, however, that many American adolescents lack information or are misinformed about many aspects of transmission, prevention, and treatment of other STDs (see table 9-7).[26] Approximately 30 percent of a nationally representative sample of 8th and 10th graders did not know that most STDs are acquired through sexual intercourse, and a substantial minority did not know or were unsure that a sore on the sex organs (33 percent) and discharge of pus from a sex organ (44 percent) were signs of STD infection. Those adolescents who were female or older had more accurate information.

Although the National Adolescent Student Health Survey found that students, particularly 10th graders, seem to know more about HIV transmission and prevention than about STDs, a large minority of students continued to be misinformed about specific sexual behaviors that put them at risk of HIV infection (7). While over 90 percent of the students, both 8th and 10th graders, knew that HIV could be transmitted through sexual intercourse, for example,

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[20] The use of condoms to prevent pregnancy among adolescents is discussed in ch. 10, "Pregnancy and Parenting: Prevention and Services," in this volume.

[21] In 1988, 47 percent of U.S. females ages 15 to 19 used a condom at first intercourse (72a). Twenty percent of sexually active females ages 15 to 19 reported current use of condoms as a method of contraception (140a).

[22] For a discussion of adolescents who have been maltreated, see ch. 3, "Parents and Families' Influence on Adolescent Health," in this volume.

[23] For a discussion of homeless and runaway adolescents, see ch. 14, "Homelessness: Prevention and Services," in this volume.

[24] For a discussion of the health of adolescents in juvenile detention facilities, see ch. 13, "Delinquency: Prevention and Services," in this volume.

[25] For a discussion of the use of alcohol and other drugs by adolescents, see ch. 12 "Alcohol, Tobacco and Drug Abuse: Prevention and Services," in this volume.

[26] It is important to note that the National Adolescent Student Health Survey did not include out-of-school youth, a group that may be at particular risk for contracting STDs.

Table 9-7—Eighth and Tenth Grade Students' Knowledge Regarding STDs, by Grade and Sex, 1987

		Grade		Sex	
	Total	8th	10th	Male	Female
Transmission of STDs:					
How do most people get STDs?					
Objects	4.5%	5.5%	3.5%	4.5%	4.5%
Kissing	3.5	4.0	3.1	4.2	2.8
*Sex	69.6	58.9	79.2	68.6	70.6
Don't know	22.4	31.6	14.1	22.7	22.2
Method of preventing STDs:					
Not having sex:					
*Very effective	57.5	48.6	65.8	56.8	58.4
Somewhat effective	14.1	14.7	13.4	14.3	13.8
Slightly effective	6.6	7.5	5.8	7.9	5.2
Not effective	11.1	14.1	8.3	10.8	11.3
Don't know	10.7	15.2	6.6	10.2	11.2
Going to the bathroom after having sex:					
Very effective	3.3	3.9	2.7	4.0	2.5
Somewhat effective	8.6	9.6	7.6	9.7	7.4
*Slightly effective	12.5	12.0	12.9	13.4	11.6
*Not effective	41.3	33.2	48.8	39.3	43.4
Don't know	34.3	41.2	28.0	33.6	35.1
Taking birth control pills:					
Very effective	7.0	8.9	5.3	7.4	6.5
Somewhat effective	11.8	13.3	10.4	11.6	12.0
Slightly effective	10.2	11.4	9.0	10.0	10.3
*Not effective	45.5	34.1	55.8	44.0	47.1
Don't know	25.6	32.3	19.5	27.0	24.1
Washing after sex:					
Very effective	6.6	7.0	6.3	7.1	6.2
Somewhat effective	13.0	12.3	13.7	16.5	9.5
Slightly effective	18.7	14.6	22.4	19.4	18.0
*Not effective	32.7	29.5	35.6	30.5	35.0
Don't know	29.0	36.6	22.0	26.6	31.4
Having sex with steady partner:					
*Very effective	23.6	19.2	27.6	26.8	20.2
*Somewhat effective	28.9	23.7	33.6	29.9	27.8
Slightly effective	14.7	16.5	13.1	12.4	17.1
Not effective	14.7	16.3	13.2	14.0	15.5
Don't know	18.1	24.3	12.5	16.9	19.3
Using condoms:					
*Very effective	43.7	38.2	48.8	47.8	39.5
*Somewhat effective	24.5	21.8	27.0	23.4	25.7
Slightly effective	6.9	8.1	5.8	5.6	8.3
Not effective	11.1	12.2	10.1	11.2	11.0
Don't know	13.7	19.7	8.2	12.1	15.4
Signs of STDs:					
Lower abdominal pain in females:					
*Is a sign	44.9	39.3	49.9	40.5	49.4
Is not a sign	7.1	7.7	6.6	6.7	7.7
Don't know	48.0	52.9	43.5	52.8	42.9
Nausea and vomiting:					
Is a sign	27.8	25.0	30.3	26.3	29.4
*Is not a sign	14.6	13.1	15.9	15.0	14.1
Don't know	57.6	61.8	53.7	58.7	56.4
Discharge of pus from sex organs:					
*Is a sign	56.4	44.8	67.1	53.4	59.7
Is not a sign	3.7	4.6	2.9	4.0	3.4
Don't know	39.8	50.6	30.0	42.6	36.9
Sore on sex organs:					
*Is a sign	67.0	56.4	76.6	64.1	70.1
Is not a sign	2.2	3.1	1.3	2.8	1.5
Don't know	30.8	40.4	22.1	33.1	28.5

Continued on next page

Table 9-7—Eighth and Tenth Grade Students' Knowledge Regarding STDs, by Grade and Sex, 1987—Continued

		Grade		Sex	
	Total	8th	10th	Male	Female
Pain when going to the bathroom:					
*Is a sign	59.3	49.2	68.5	56.6	62.2
Is not a sign	4.5	5.3	3.7	4.8	4.1
Don't know	36.2	45.4	27.8	38.6	33.7
Appropriate responses to possible STD:					
Wait to see if signs go away:					
Helpful	8.3	11.5	5.5	9.1	7.5
*Harmful	56.6	47.8	64.6	51.1	62.4
No effect	12.9	13.6	12.3	15.4	10.3
Don't know	22.1	27.1	17.6	24.4	19.7
Take leftover medicine for similar problem:					
Helpful	8.6	9.8	7.4	10.1	7.0
*Harmful	59.9	56.2	63.3	54.5	65.6
No effect	8.6	8.1	9.0	8.5	8.8
Don't know	22.9	25.9	20.3	27.0	18.7
Get tested for STD:					
*Helpful	88.2	84.6	91.5	84.8	91.8
Harmful	0.6	0.7	0.5	0.8	0.4
No effect	1.6	2.2	1.0	2.2	1.0
Don't know	9.6	12.5	6.9	12.2	6.8
Do not have sex:					
*Helpful	67.2	63.4	70.6	64.7	69.8
Harmful	3.0	3.2	2.8	3.4	2.6
No effect	13.7	13.4	13.9	13.9	13.4
Don't know	16.1	20.0	12.6	18.0	14.2
Tell sex partner:					
*Helpful	76.5	68.7	83.6	74.1	79.0
Harmful	2.3	3.5	1.3	3.1	1.5
No effect	7.3	9.2	5.5	7.5	7.0
Don't know	13.9	18.7	9.6	15.3	12.5
Take medicine only until signs go away:					
Helpful	24.4	24.3	24.6	28.1	20.6
*Harmful	31.8	26.5	36.7	27.3	36.6
No effect	9.8	10.2	9.4	10.9	8.7
Don't know	33.9	39.0	29.3	33.8	34.1
Treatment for STDs:					
Public health department informs parents of STDs in minors:					
True	40.1	47.1	33.7	39.7	40.4
*False	24.3	16.4	31.4	25.6	22.9
Don't know	35.7	36.5	34.9	34.7	36.7
Most clinics require parental permission for treatment of minors:					
True	43.8	50.7	37.6	45.1	42.4
*False	21.1	15.0	26.7	21.9	20.4
Don't know	35.1	34.3	35.8	33.0	37.2

KEY: * = Correct response. In some cases, more than one response was considered correct.

SOURCE: American School Health Association, Association for the Advancement of Health Education, and the Society for Public Health Education, Inc., *The National Adolescent Student Health Survey: A Report on the Health of America's Youth*, a cooperative project of the National Institute on Drug Abuse, Alcohol, Drug Abuse, and Mental Health Administration; the Centers for Disease Control; and the Office of Disease Prevention and Health Promotion, Public Health Service, U.S. Department of Health and Human Services (Oakland, CA: Third Party Publishing Co., 1989).

close to 20 percent of the students were not aware that having multiple sexual partners, a male having sexual intercourse with another male, or having sexual intercourse with someone who has had several partners increased an individual's chances of getting HIV infection (7). Data from State and local surveys confirm that students are also misinformed about factors that do not increase risk, but which raise fear and have public policy implications, such as donating blood (see table 9-8).

Misperceptions about effective STD and HIV prevention methods persist. The National Adolescent Student Health Survey found that the majority of students were not aware that taking birth control pills (55 percent) or washing after sex (67 percent) were ineffective methods of protection from STDs (see table 9-7). Almost a quarter of the national student sample did not know that abstaining from sexual intercourse lowered their risk of infection and 20 percent did not know that not using a needle[27] while taking drugs lowered the risk (7). One local sample reported that 19 percent of 657 Connecticut junior and senior high school students believed that not kissing an HIV-infected person on the cheek was an effective method of prevention (92). Although most of the students surveyed in the National Adolescent Student Health Survey (86 percent overall) knew that the use of condoms during sexual intercourse decreases their risk of getting HIV infection (7), earlier data from 14- to 18-year-old San Francisco students suggest that there may be significant racial differences in this knowledge, whites (71.7 percent) having more knowledge than blacks (59.9 percent) and Latinos (58.3 percent) (62).

Other Concerns

To change behaviors that put them at risk for HIV infection or STDs or to maintain safe behaviors, adolescents must perceive that they could become infected (104). For AIDS prevention efforts, this poses a particular problem. Given the estimated 10-year latency period between HIV infection and diagnosis with AIDS, it is unlikely that most adolescents now know or encounter another adolescent who has AIDS.[28] [29]

Furthermore, even though adolescents are developing the cognitive abilities to perceive risks accurately,[30] some observers believe that adolescents often do not weigh relevant risks in making decisions (131,137). In not weighing relevant risks, adolescents may be no different from adults (70,197).[31] Even though many adolescents worry about getting infected (83,138), they, like adults, may be more concerned about satisfying needs (e.g., peer acceptance, having a sexual relationship, being attractive to members of the opposite sex) than about preventing possible HIV or STD infection. As a result, they may try to prevent HIV infection through inappropriate or ineffective means (87). In addition, however, STD prevention during adolescence may be constrained by ambiguities in the social status of American adolescents.[32] While adolescents are bombarded with messages from commercial media that are likely to encourage them to engage in sexual intercourse, their level of realistic information about effective means to prevent HIV infection and STDs may be limited by external forces (e.g., school boards) (147,147a,204). As discussed throughout this Report, there are many barriers that restrict adolescents' access to health care, including barriers to obtaining information. Even when information about treatment is available, there may be legal barriers (e.g., requirements for parental consent),[33] financial barriers,[34] and a scarcity of appropriately trained health care professionals.[35] Thus, in considering strategies for reducing the burden of HIV infection and STDs on adolescents, it is important not to "blame the victims" of these health conditions (91b). General strategies for reducing barriers to care, and for establishing a more effective approach to health promotion and disease prevention for adolescents are discussed in Vol. I of this Report (205a). A critique of existing prevention and

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[27] The National Adolescent Student Health Survey did not explicitly mention sharing IV needles but asked students if not taking illegal drugs with a needle lowered their chance of getting AIDS.

[28] This observation may not hold true, however, for adolescents in areas where adolescents are likely to have sex early; adolescents with older, infected partners; or adolescents who use IV drugs early.

[29] There are virtually no data on the number of adolescents who know someone with AIDS. The National Health Interview Survey conducted by the National Center for Health Statistics in the Department of Health and Human Services asks individuals over age 18 whether they know someone with AIDS, but it does not collect comparable data on adolescents.

[30] Adolescents' cognitive development is discussed in ch. 2, "What Is Adolescent Health?" in this volume.

[31] For a discussion of several studies of the decisionmaking abilities of adolescents, see ch. 17, "Consent and Confidentiality in Adolescent Health Care Decisionmaking," in Vol. III.

[32] See ch. 2, "What Is Adolescent Health?" in this volume.

[33] See ch. 17, "Consent and Confidentiality in Adolescent Health Care Decisionmaking," in Vol. III.

[34] See ch. 16, "Financial Access to Health Services," in Vol. III.

[35] See ch. 15, "Major Issues Pertaining to the Delivery of Primary and Comprehensive Health Services to Adolescents," in Vol. III.

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Table 9-8—Percentage of Correct Responses Among U.S. High School Students for Questions Related to HIV Transmission Routes, by Selected States and Cities, 1989

			Percentage of correct responses concerning HIV transmission routes			
Site	Sample size[a]	Student response rate (%)	Donating blood does not	Insect bites do not	Using public toilets does not	Having a blood test does not
State						
Alabama[b]	6,702	90	61.1	43.2	67.5	76.9
Arkansas[b]	303	86	63.3	44.0	68.9	72.5
California[b c]	1,858	41	55.6	42.3	72.2	70.8
Colorado[c d]	1,908	NA	52.0	45.6	82.6	69.8
Delaware[e]	2,414	NA	71.6	49.6	69.1	77.2
District of Columbia[e f]	1,077	66	49.0	44.2	70.9	68.3
Georgia[d]	421	68	57.0	45.3	73.0	68.5
Hawaii[e]	4,908	78	51.7	64.0	82.5	72.5
Idaho[d]	1,008	NA	54.3	43.3	75.5	67.4
Iowa[e]	1,463	90	60.9	45.3	79.2	74.2
Kansas[d]	1,101	83	64.7	58.0	80.1	72.8
Kentucky[e]	1,458	84	62.3	54.8	71.0	74.6
Louisiana[b]	6,013	70	58.2	50.1	66.8	71.2
Massachusetts[c e]	2,043	81	66.5	54.3	76.6	76.3
Michigan[b]	873	90	66.1	48.0	72.1	76.4
Missouri[b]	1,201	NA	63.3	44.2	73.9	73.4
New Jersey[c d]	2,153	88	61.4	50.6	73.2	73.1
New Mexico[d]	770	NA	55.9	50.7	75.2	72.0
New York[c d]	3,026	NA	56.0	58.4	81.3	74.6
North Carolina[d]	10,279	NA	52.8	57.6	75.7	75.3
North Dakota[d]	2,924	NA	63.7	57.6	84.2	80.3
Ohio[d]	4,341	NA	64.1	50.2	75.1	73.8
Oklahoma[d]	2,521	43	60.2	55.6	76.1	75.5
Oregon[b]	2,895	74	68.6	47.5	72.4	75.8
Pennsylvania[c e]	4,548	82	71.9	54.8	76.4	77.7
Rhode Island[b]	7,076	77	69.9	63.9	NA	80.3
South Dakota[e]	1,392	87	60.9	48.4	80.1	72.1
Tennessee[d]	2,098	NA	65.3	43.2	66.6	74.6
Utah[d]	4,174	NA	54.7	48.8	70.1	69.1
Washington[c d]	1,176	NA	74.5	66.5	84.3	82.4
City						
Chicago[b]	1,171	90	39.9	41.9	70.5	64.8
Dallas[e]	3,483	87	54.1	55.5	76.4	74.1
Fort Lauderdale[d]	861	90	49.0	45.2	66.7	67.7
Jersey City[e]	493	70	32.4	43.9	59.0	63.2
Los Angeles[d]	3,030	90	37.9	29.0	52.1	58.5
Miami[e]	1,192	83	42.1	45.6	70.3	68.6
New York City[d]	1,135	NA	33.6	52.9	71.0	64.2
San Diego[d]	317	61	61.8	58.7	84.9	79.4
San Francisco[d]	793	NA	47.7	41.7	68.8	63.4
Seattle[b]	1,374	67	56.4	48.5	75.7	70.7

KEY: NA = not available.

[a] Schools and students were not randomly assigned.

[b] Probability sample, unweighted data.

[c] Surveys did not include students from the largest cities.

[d] Nonprobability sample, unweighted data.

[e] Probability sample, weighted data.

[f] The District of Columbia is categorized as a State for CDC funding purposes.

SOURCE: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, "HIV-Related Beliefs, Knowledge, and Behaviors Among High School Students," *Morbidity and Mortality Weekly Report* 39(23):385-397, June 15, 1990.

treatment systems, and specific strategies related to HIV infection and STDs, are included below.

Prevention of AIDS/HIV Infection and Other STDs

In the absence of a cure, preventing initial infection is the best method for controlling the spread of some STDs and is the only way to effectively control the spread of HIV (234). As suggested by the recent rise in syphilis rates among adolescents, prevention efforts directed at changing risky sexual and drug-using behaviors will continue to be necessary even if a cure for certain STDs and HIV infection is found (24). Given that adolescents have differing levels of risk for infection, prevention efforts can take many forms. For low-risk individuals, for example, efforts can be limited to education and counseling to prevent initial STD and HIV infection. For those at higher risk, prevention efforts may include the detection of infection among asymptomatic and symptomatic adolescents and their sex partners and the effective treatment of those who are already infected (234).

An alternative goal may be the modification, rather than the elimination, of risky sexual and drug-using behaviors. As noted by the National Academy of Sciences, it is often easier to modify an existing behavior than to eliminate it (143). For adolescents who engage in sexual intercourse, modifications may include using condoms, avoiding multiple partners, and knowing the sexual and drug history of sexual partners and acting on that information. For adolescents who have been using drugs, modifications may include using sterile needles to inject drugs, not sharing needles, or using bleach to clean injection equipment.[36]

Until recently, HIV prevention efforts have not been focused on adolescents (209). Currently, however a wide range of educationally based preventive interventions target adolescents of varying ages within and outside schools, including school-linked health centers, and community-based youth services agencies (e.g., The Door in New York City, Bridge Over Troubled Waters in Boston, and El Puente in Brooklyn).[37] It is important to note that preventive interventions are not—and should not be—limited only to didactic presentations to adolescents. They include teen theater, television and radio campaigns, "rap" contests, poster contests, street outreach workers, peer counselors, role-playing activities, interactive computer-based information dissemination systems, and STD and AIDS hot lines, but they also include services that may require more intensive efforts on the part of the clinical services system, such as condom distribution programs, needle exchange and bleach programs, and testing for HIV and STDs.

Systematic evaluation of the effectiveness of preventive interventions is rare (26), particularly in the case of interventions targeting adolescents at increased risk of infection (e.g., minority adolescents, gay adolescents, runaways, and homeless adolescents) (201,209). Furthermore, many preventive interventions are not based on a clear theoretical framework (72). Thus, little is currently known about what interventions are successful in preventing the spread of HIV or STD infections among adolescents.

The need for effective HIV and STD preventive interventions for adolescents at higher risk is clear. Although most recent data suggest that some adolescents have taken steps to reduce their risk of HIV infection (83,95,155), many adolescents are not consistently adopting safer sex practices. In a 1988 Massachusetts telephone survey, for example, only 19 percent of the sexually active adolescents ages 16 to 19 reported adopting condom use because of AIDS (95). Low proportions of condom users were also observed among a group of adolescent males with hemophilia (31 percent; N = 26) and a New York City minority adolescent population (39 percent; N = 196) (83,155). In the Massachusetts survey, only half of those reporting condom use used condoms all the time (95). In a study in New York City, 32 percent of the sexually active minority adolescents reported engaging in intercourse without condoms during their last sexual encounter (83).

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[36] OTA did not review the effects of using bleach as prevention against infection.

[37] Having access to a school-linked health center may help adolescents reduce the time between exposure to STD infection and seeking medical care (35). For a discussion of school-linked health centers, see ch. 15, "Major Issues Pertaining to the Delivery of Primary and Comprehensive Care to Adolescents," in Vol. III.

Problems in Evaluating the Effectiveness of AIDS and STD Prevention Programs

Over the past several years, various approaches have been developed for the prevention of HIV infection and other STDs. The preventive programs undoubtedly vary in quality, but their effectiveness has been difficult to assess.[38]

Numerous obstacles impede evaluations of the effectiveness of AIDS and STD prevention programs—limited funds or time, the need for technical expertise, and certain methodological difficulties (e.g., separating the effects of the environment from the intervention, ethical issues of using control groups, parental concern about particular behavior-related questions) (117,256).

Limited funds, time, or other factors often force evaluators to choose between process evaluation and outcome evaluation (117).[39] The most accurate evaluation of a program's success involves both process and outcome evaluations (117). Unfortunately, however, many interventions for the prevention of HIV infection and STDs among adolescents have undergone process evaluation alone (203). Evaluation of an intervention's effectiveness is difficult when no definite link has been established between the process and desired outcomes.

Adolescents are not a homogeneous group, so preventive interventions should have differing goals depending on the subgroup being targeted—e.g., the subgroup of adolescents who are not sexually active and do not use drugs (especially younger adolescents) v. subgroups of adolescents who engage in sexual intercourse or use drugs. Unfortunately, many HIV and STD prevention efforts do not have clear goals. Most programs are probably seeking to reduce the rates of HIV and STD infection among adolescents, but measuring infection rates is difficult because of the asymptomatic nature of many STDs, the hesitancy of adolescents to seek treatment, and many adolescents' concerns about confidentiality (144), and the cost and intrusiveness of population-based testing. Furthermore, the initial base rates of HIV infection and STDs are low, so determining the effectiveness of a preventive program is difficult if success is measured in terms of decreasing infection rates.

For these and other reasons, most evaluators use outcomes other than HIV or STD infection rates to determine a preventive intervention's success. Such measures typically include cognitive outcomes (beliefs, attitudes, behavioral intentions) or self-reported behavioral outcomes that bear directly on the transmission of HIV infection and STDs (144).

Some AIDS and STD prevention programs seek to increase adolescents' factual knowledge and to change their attitudes related to HIV and STD prevention, although increases in individuals' factual knowledge and changes in attitude do not necessarily lead to changes in behavior (95,109,155). Other prevention programs attempt to influence behaviors that eliminate or reduce an individuals' risk of infection or protect against infection. Many AIDS and STD prevention programs do not measure the outcomes they seek to maintain or modify, however, so no information about the impact of the preventive intervention is developed.

Another problem in evaluating the effectiveness of HIV and STD prevention efforts is that few prevention programs use experimental designs (63, 144,203). Subjects are often volunteers in convenient settings without regard to an appropriate control group. Also, parents may exempt their adolescent children from participating in HIV/AIDS and STD educational activities in the schools (147). Only rarely are subjects assigned randomly to an intervention, and many preventive interventions use "before and after" evaluation designs[40] with virtually no long-term followup, making it impossible to see if program effects are maintained. The length of time subjects spend in an intervention and the period between completion of an intervention and posttest are not standardized.

Education-Based AIDS and STD Prevention Efforts

OTA and the U.S. General Accounting Office (GAO) have each identified elements of health education models that theoretically should be relevant to designing education-based AIDS and STD prevention interventions that are effective in changing risky behaviors (199,203). Taken together, these elements include the following:

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[38] Central to any type of evaluation of STD/AIDS intervention is the accuracy of self-report data on sexual and drug behaviors and attitudes. These concerns are addressed in ch. 12, "Alcohol, Tobacco, and Drug Abuse: Prevention and Services," in this volume.

[39] *Process evaluation* involves the evaluation of aspects of a program's implementation and operation (e.g., number of pamphlets distributed); *outcome evaluation* measures an intervention's results (e.g., increased knowledge, changed behavior).

[40] Before and after comparisons of an evaluation may be informative when no change occurs and might be useful in future program designs (144).

- using a credible source to reach an intended audience by acknowledging the audience's beliefs and values;
- making individuals understand that they may be at risk of infection so that they will be motivated to change risky behaviors;
- developing skills among individuals to overcome physical and psychological barriers to behavioral change;
- stressing positive aspects of an intervention, but still acknowledging the negative aspects, so as to increase individuals' belief in the credibility of the source;
- gaining the approval of friends and the community to increase individuals' intentions to change; and
- using role models (e.g., opinion leaders and peer counselors) to change risky behavior.

Some education-based AIDS and STD prevention efforts target all adolescents, including adolescents who experiment with risky sexual and drug-using behaviors, by seeking to increase their knowledge about modes of HIV and STD transmission and ways to avoid HIV and STD infection. Other education-based AIDS and STD prevention activities seek to build adolescents' decisionmaking skills and strategies to resist real and perceived peer pressure. Other education-based prevention efforts, which include traditional sex education, and drug education programs, are discussed in other chapters of this Report.[41]

Education-based AIDS and STD prevention efforts that focus specifically on adolescents are discussed below. Some of these education-based prevention efforts involve families, some take place in schools, and some take place in community settings.

The Best Way To Avoid AIDS Is Not To Have Sex.
The Next Best Way Is To Use A Condom.
It's Your Choice.

Photo credit: Office of Technology Assessment

Posters such as this one in a high school offer an opportunity to remind adolescents of the dangers of AIDS. It is unclear whether this kind of education effort is enough to change adolescents' behavior, however.

Education-Based Prevention Efforts That Involve Families

Generally, individuals are more likely to act on information if the person or agency providing the information is credible (203). Many, if not most, adolescents have been found to perceive physicians, peers, and parents as credible sources of information (45,95,155,274). Adolescents from racial or ethnic minority groups who view the extended family as an important social support system (13,126,210) may see members of the extended family as credible deliverers of health information.[42]

Family interventions may have particular promise in helping adolescents delay sexual intercourse and avoid drug use, because most adolescents live at home. Often, however, parents do not discuss sexuality-related topics, including homosexuality and prostitution, with their adolescent children (95,204,248); and many adolescents report having a difficult time discussing such topics with their parents (45,174,204). For illustration, although adolescents were not specifically targeted to receive CDC's brochure "Understanding AIDS,"[43] CDC hoped they would be reached by promoting discussions of AIDS within families (223). Provisional data from the 1988 National Health Interview Survey conducted by the National Center for Health Statistics in the U.S. Department of Health and Human Services (DHHS) showed that while 35 percent of the parents reported discussing the brochure with their 10- to 17-year-olds, the remainder (over 60 percent) did not discuss it (244,245). The quality of the discussions among those who did discuss the brochure is not known.[44]

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[41] Sex education is discussed in ch. 10, "Pregnancy and Parenting: Prevention and Services," and drug education is discussed in ch. 12, "Alcohol, Tobacco, and Drug Abuse: Prevention and Services," both in this volume.

[42] For a discussion of parental influences on adolescent decisionmaking, see ch. 3, "Parents and Families' Influence on Adolescent Health," in this volume. For a discussion of issues in the delivery of services to racial and ethnic minority adolescents, see ch. 18, "Issues in the Delivery of Services to Selected Groups of Adolescents," in Vol. III.

[43] The brochure, which describes the modes of HIV transmission and methods of prevention, was mailed to all households and residential post office boxes in the United States between May 26 and June 30, 1988 (223).

Currently, few of the adolescent HIV or STD prevention efforts that are being carefully evaluated target families. The Office of Minority Health within DHHS, under its Minority HIV Education/Prevention Grant Program, is funding a project in Salt Lake City, Utah, that provides HIV education and prevention in the homes of Mexican American adolescents who are engaging or may engage in risky behaviors associated with HIV transmission.[45] Social service workers try to foster family communication, strengthen family relationships, and build skills to support less risky behaviors (22).

One major drawback of family interventions is that family interventions are unable to reach runaway, throwaway, homeless, and incarcerated adolescents who may engage in behaviors that place them at increased risk of infection.[46] Prevention efforts other than those that are family-based are necessary to reach these populations.

Education-Based Prevention Efforts in Schools

The vast majority of American adolescents, particularly younger adolescents, attend school (206). For that reason, some observers have suggested that culturally sensitive and age-appropriate prevention programs in schools may be one of the most practical ways to influence the spread of HIV infection and STDs (63,82,209,280). In fact, most students report wanting to learn about AIDS and, presumably, STDs, at school (92). Studies of education-based AIDS and STD prevention efforts in schools are summarized in table 9-9.

Even though most States encourage STD or AIDS education in schools, many students, particularly younger adolescents, are apparently not receiving any STD or AIDS education (3,7). Among the public secondary schools that reported providing sex education, 95 percent reported offering at least one class on STDs (3). Nevertheless, 68 percent of the students surveyed in the National Adolescent Student Health Survey in 1987 reported either not knowing whether they had had STD instruction or never receiving such instruction (7).[47] Additionally, 65 percent of the students surveyed reported either not having or not knowing if they had had AIDS education, with relatively no difference between older and younger students (7). This information is confirmed by the National Association of State Boards of Education, which reported in 1989 that only 28 States and the District of Columbia required HIV/AIDS education (147).[48]

The Federal Government supports AIDS and STD education primarily through monetary support and technical assistance to States. The scope and content of the AIDS and STD educational messages developed with Federal assistance are determined at either the State or local level. CDC had cooperative agreements with State and local education agencies totaling over $19 million in program years 1989-1990, to support developmentally appropriate HIV/AIDS education in the schools (118,227). In addition, CDC has been working with State education departments to develop a method for monitoring changes in students' knowledge, attitudes, and behaviors (118,147,226). According to CDC, AIDS and STD education may be most effective within a comprehensive school health education program (232,238). Only 19 States, however, require that HIV/AIDS education be taught within either a

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[44] CDC's National AIDS Information and Education Program's analysis of cross-tabulations of knowledge questions with those adults who said they had children between 10 and 17 years of age (183) may provide some information about whether parents gave their children accurate information.

[45] For a discussion of issues pertaining to the delivery of services to adolescents from Hispanic and other racial or ethnic minority groups, see ch. 18, "Issues in the Delivery of Services to Selected Groups of Adolescents," in vol. III.

[46] For a discussion of the problems of runaway, throwaway, and homeless adolescents, see ch. 14, "Homelessness: Prevention and Services," in this volume. Incarcerated adolescents are discussed in ch. 13, "Delinquency: Prevention and Services," in this volume.

[47] Only 18 percent of the 8th graders reported receiving instruction on STDs as compared with 44 percent of the 10th graders (7).

[48] The 28 States are Alabama, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Maryland, Michigan, Minnesota, Nevada, New Mexico, New York, North Carolina, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Dakota, Tennessee, Utah, Vermont, Virginia, Washington, and West Virginia (147).

[49] The State of Washington requires that HIV/AIDS education be added to the STD requirement (147).

Table 9-9—Studies Evaluating Education-Based AIDS and STD Prevention Efforts in Schools

Study[a]	Goal(s)	Intervention(s) and outcome measure(s)	Research design	Study population, sample size, and year data collected	Results
Brown, Fritz, and Barone, 1989	Improve knowledge, attitudes toward future behaviors and tolerance for people with AIDS, and coping strategies	*Intervention:* Two 45-minute classes on AIDS taught by health teachers. About half of each session was a film presentation and the remaining time was an open class discussion. *Outcome measure:* Performance on knowledge, attitude, and coping survey	Pretest/posttest design, no comparison group	*Study population:* Predominantly white, suburban, middle class Rhode Island 7th and 10th graders *Sample size:* 7th grade: 174 10th grade: 139 *Year data collected:* NA	Knowledge test scores increased significantly for both grades. Students in both grades reported a greater likelihood to engage in safer behaviors. 7th graders changed their attitudes for risk behaviors and tolerance for people with AIDS. Only the former changed significantly for 10th graders. 7th grade males and 10th grade females reported being more tolerant. 7th graders reported endorsing wishful thinking and self-criticism coping strategies less frequently, and 10th graders reported endorsing social withdrawal less frequently and problem-solving-coping strategies more frequently.
DiClemente, Pies, Stoller, et al., 1989	Improve AIDS knowledge, decrease misconceptions, and increase tolerance toward individuals with AIDS	*Intervention:* Three class period AIDS prevention curricula presented on consecutive days *Outcome measure:* Performance on knowledge questionnaire	Pretest/posttest control group design	*Study population:* Middle and high school students in the San Francisco Unified School District *Sample size:* High school: 254 Middle school: 385 *Year data collected:* 1986 or 1987	Intervention group showed statistically significant knowledge gains and fewer misconceptions. Middle school students demonstrated more knowledge gain (mean of 4.8) than high school students (mean of 3.5), and both groups had more knowledge than the nonintervention group. Students in the intervention group showed less fear about having a student with AIDS in the classroom.
Hernandez and Smith, 1990	Compare the effects of three primary prevention education programs with differing philosophies: abstinence, condom use, delaying sex, and considering alternatives	*Intervention:* One-hour multimedia presentation *Outcome measure:* Performance on attitudes, intentions, and behavior questionnaire.	Pretest/posttest design with control group	*Study population:* Students ages 18 to 21 from two Southeastern State universities *Sample size:* 388 students completed both a pretest questionnaire and posttest questionnaire 6 weeks later. *Year data collected:* 1988	No significant effects of programs on any cognitive (e.g., sexual motivation, intended condom use) or behavioral items (e.g., condom use, number of sex partners). The abstinence program did not lead to an increase in abstinence, nor did explicit condom use information lead to condom use. However, those in the decisionmaking group which stressed condom use were significantly more likely to use condoms after the program than were those in the group which stressed all alternatives including delaying sex.

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Table 9-9—Studies Evaluating Education-Based AIDS and STD Prevention Efforts in Schools—Continued

Study[a]	Goal(s)	Intervention(s) and outcome measure(s)	Research design	Study population, sample size, and year data collected	Results
Huszti, Clopton, and Mason, 1989	Increase AIDS knowledge and improve attitudes toward people with AIDS and increase practice of preventive behaviors	*Intervention:* 45-minute AIDS educational program using either a lecture or film *Outcome measure:* Performance on knowledge and attitude questionnaire	Pretest/posttest/1 month followup design. Volunteer subjects were randomly assigned to 1 of 3 conditions: lecture, film, or no program.	*Study population:* 10th grade students ages 14 to 17 attending 2 suburban Oklahoma City area public schools *Sample size:* 448 students completed pretest, posttest, and followup *Year data collected:* NA	Intervention groups' knowledge scores increased significantly from pretest to posttest and decreased significantly at 1-month followup although scores were still higher than at pretest. Students hearing the lecture had significantly higher knowledge scores than either film or no program groups at both posttest and followup. Students watching the film had significantly higher scores than the no program group. In addition, intervention groups had significantly more positive attitudes toward people with AIDS and preventive behaviors than the no program group. However, these attitudes decreased significantly 1 month later. Students' attitudes toward preventive behaviors were not significantly different than at pretest. Females had significantly higher levels of knowledge and more positive attitudes toward people with AIDS at all measurement times and more positive attitudes toward preventive behaviors than males at posttest and followup. Remark: Students' initially high positive attitudes toward preventive behaviors may have created a ceiling effect.
Miller and Downer, 1987	Improve AIDS knowledge and attitudes	*Intervention:* 50-minute multimedia, AIDS program *Outcome measure:* Performance on knowledge and attitude survey	Pretest/posttest design, no comparison group	*Study population:* Seattle high school students *Sample size:* 114 students completed pretest 1 month prior to and 1 week after educational program. 53 students completed a posttest 8 weeks later *Years data collected:* 1986-87	Students' knowledge test scores increased from 78% to 90%. The percentage who thought they might get AIDS did not decrease significantly. The 8-week posttest showed retention of knowledge.
Sroka, 1986	Improve knowledge and modify attitudes and behavioral intentions	*Intervention:* 5 days of STD education *Outcome measure:* Performance on knowledge, attitudes, and behavioral intentions survey	Pretest (1 week before)/ posttest (1 week after) design, involving a control group. Teachers were also asked to evaluate what they perceive to be significant gains in students' knowledge, attitudes, and behavioral intentions.	*Study population:* 9th grade students in an urban inner-city area *Sample size:* Intervention group: 67 (completed pretest and posttests Control group: 87 (completed pretest and posttests) *Year data collected:* 1986	Knowledge, attitudes, and behavioral intentions improved in the intervention group compared with the control group (although significance was not determined). In general, a large proportion of teachers felt that substantial gains had been made in students' knowledge (98%), attitudes (81%), and behavioral intentions (77%). Remark: Teachers surveyed were located in only 3 States. Results may not be generalizable to other populations.

Table 9-9—Studies Evaluating Education-Based AIDS and STD Prevention Efforts in Schools—Continued

Study[a]	Goal(s)	Intervention(s) and outcome measure(s)	Research design	Study population, sample size, and year data collected	Results
Stout and Rivara, 1989[b]	This study reviewed five earlier studies of junior and senior high school-based sex education programs.	*Intervention:* School-based sex education programs *Outcome measure:* Sexual activity, contraceptive behavior, and pregnancy	Variety of research designs. Three were cross-sectional using national survey data. One was a longitudinal survey. The final study was a case-control of exemplary sex education programs.	*Study population:* Age of participants varied: 15- to 16-year-olds sampled in the 1981 National Survey of Children; 15- to 19-year-old females; nationally representative sample of 14- to 22-year-olds in 1979; nationally representative sample of 15- to 19-year-olds living in households; and elementary through high school students *Sample size:* Varied from 500 to 12,069 *Years data collected:* Varied from mid-1970s to mid-1980s	Three studies found no effect on sexual activity. One study showed lower prevalence rates for those who had taken a class while the other found a weak positive relationship. There appeared to be little effect on use of effective methods of birth control. No measurable impact was found on pregnancy rates except in one study where a lower rate among 15- to 17-year-old females was observed. Remark: Studies did not have control groups, and all were retrospective. The quality of the programs could not be determined.
Yarber, 1986	Improve students' knowledge and attitudes related to preventive behaviors related to STDs	*Intervention:* Five class periods (250 minutes) of a CDC-sponsored STD curriculum, *STD: A Guide for Today's Young Adults* *Outcome measure:* Performance on knowledge and attitude survey.	Quasi-experimental design involving experimental (CDC curriculum) and 2 control groups (schools' standard STD educational program of 2 to 6 class sessions and no STD instruction). Pretest and posttests immediately following instruction and 6 weeks later. Students were not randomly assigned.	*Study population:* Junior high and high school students ranging in age from 12 to 19 in 6 school districts (3 suburban, 2 urban, 1 rural) in Eastern and Central States *Sample size:* CDC STD curriculum: 566 School STD curriculum: 161 No STD education: 387 *Year data collected:* 1985	CDC curriculum improved students' STD knowledge. However, increases in knowledge decreased at 6-week followup. Intentions to engage in healthy behaviors increased, but not as much as beliefs and feelings about such behaviors. Six weeks later, scores were not significantly different than at pretest.

KEY: NA = not available.

[a] Full citations are listed at the end of this chapter.

[b] This study reviewed the following five school sex education studies: Dawson, 1986; Furstenberg, 1985; Kirby, 1984; Marsiglio and Mott, 1986; and Zelnick and Kim, 1982. Full citations for these studies are listed at the end of this chapter.

SOURCE: Office of Technology Assessment, 1991.

comprehensive health or family life education curriculum (147).[49]

Given the fact that risky sexual and drug-using behaviors are directly related to the transmission of HIV and STDs, the ultimate goal of education-based AIDS and STD prevention efforts is to increase the use of preventive behaviors (35,99). As the programs listed in table 9-9 illustrate, education-based AIDS and STD prevention programs in schools often attempt to influence students' behavior by increasing knowledge about AIDS and, to a lesser extent, knowledge about STDs (including methods of transmitting and preventing infection); by changing students' attitudes; and by modifying their behavioral intentions with respect to preventive behaviors (3,27,63,99,112,135,147,187,280). There is little evidence to suggest that increased knowledge alone will result in behavioral change (14,203). Behavioral intentions are believed to be more closely related to behavioral change (2). Very few studies have evaluated how educational interventions affect risky behavior related to the transmission of STDs and HIV infection (203,280). Thus, very little is known about the effectiveness of education-based STD and AIDS prevention efforts in schools. Only 11 States include an evaluation component in their HIV/AIDS education programs, and most of those are insufficient to measure the educational program's effectiveness (147).

Some available evidence suggests that brief educational instruction can significantly increase adolescents' knowledge about HIV and STD infection. A study evaluating the impact of a 3-hour AIDS prevention curriculum taught in San Francisco middle and high school classes (63), for example, found that students receiving the curriculum (including knowledge that condoms could reduce the risk of HIV transmission during sexual intercourse) showed significantly more knowledge than students who received no instruction. Because students' knowledge was not assessed after a longer period of time, however, it is possible that the increases in knowledge may not have remained strong. One study demonstrated that students' knowledge about STDs increased significantly immediately following a CDC-sponsored STD curriculum and then decreased 6 weeks later (280).

The method by which AIDS and STD information is presented may be important in students' ability to retain knowledge they have gained, although the evidence is unclear. Traditionally, STD education classes have consisted of didactic biomedically oriented lectures (35), although videotapes and films are becoming more popular. By using a 50-minute videotape, Miller and Downer demonstrated that Seattle students retained their increase in knowledge 8 weeks later (135).[50] In contrast, one study involving 10th grade Oklahoma City students found that a lecture increased students' knowledge more than watching a film (99). Both the film and lecture were more effective than having no program. A month later, knowledge gains remained significantly greater than at pretest (99).

Data from education programs for the prevention of adolescent pregnancy[51] and programs for the prevention of smoking suggest that effective AIDS and STD prevention efforts must go beyond the transferring of knowledge to helping adolescents deal with real and perceived peer pressures in negotiating safer sex and drug use behaviors with unwilling or ambivalent partners by building decisionmaking and communication skills (23,111,126, 178,199,203). So far, most education-based AIDS and STD prevention programs have not gone beyond disseminating knowledge and have not attempted to provide adolescents an opportunity to build skills for the prevention of HIV infection and STDs (27,63,99, 135,187,280). Changing behaviors without providing opportunities to build skills appears to be most difficult (280).

Two currently popular educational programs being used to teach students about the behavioral aspects of STDs, including AIDS, provide information about STD prevention and treatment and encourage educators to teach skills, such as resisting peer pressure, reducing risky behaviors, and negotiating safer sex (188,189,280). Neither program measures changes in students' actual behaviors, however, so it is not clear that students are using these skills (189,280).

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[49] The State of Washington requires that HIV/AIDS education be added to the STD requirement (147).

[50] The videotape was entitled "Sex, Drugs, and AIDS" (135). A recent study of 584 California college students demonstrated that videotapes differ in their ability to improve knowledge. Students who viewed the "Sex, Drugs, and AIDS" videotape and those who viewed "AIDS: What Everyone Needs to Know" evidenced significantly greater knowledge gains than did students who viewed "AIDS: Acquired Immune Deficiency Syndrome" and "Beyond Fear: The Virus" (170).

[51] For a discussion of the prevention of adolescent pregnancy, see ch. 10, "Pregnancy and Parenting: Prevention and Services," in this volume.

In a 1984 evaluation of 14 promising sex education programs, many of which provided STD information, Kirby concluded that most of the programs had little impact on the number of times adolescents reported intercourse or on adolescents' use of birth control (111).[52] Stout and Rivara, on the basis of a review of five studies that evaluated the effect of junior and senior high school-based sex education programs, confirmed Kirby's findings that sex education programs appear to have no effect on the levels of adolescents' sexual activity (191).

With Federal demonstration grant money provided by the DHHS Office of Population Affairs under the Public Health Service Act Title XX Adolescent Family Life (AFL) Program, the Arkansas Family Life Education Project has developed a 24-day abstinence curriculum for junior high and high school students; this curriculum is aimed at developing students' skills in decisionmaking, peer pressure reversal, and communication (281). In various components of the high school curriculum, for example, students discuss the advantages and disadvantages of avoiding getting an STD and why STDs receive no media attention. Classroom volunteers receive scripts of different life situations and must try to persuade a peer "decisionmaker" to accept their perspective on life options. Preliminary data indicate that junior high students who participated in the program report decreased intentions of engaging in premarital intercourse (281). Data for the high school program curriculum was field tested during 1989-1990 in eight schools.

Education-based AIDS and STD prevention activities in schools can be expected to reach most adolescents, but a major limitation of efforts that occur in schools is that they overlook school dropouts. In "Guidelines for Effective School Health Education To Prevent the Spread of AIDS," CDC noted that the needs of hard-to-reach adolescents, such as out-of-school adolescents, non-English-speaking adolescents, physically impaired adolescents, and learning disabled adolescents, should be addressed (118,232). A 1989 survey by the National Association of State Boards of Education found, however, that only Minnesota had addressed the need to target hard-to-reach adolescents in its State policy regarding HIV/AIDS education (147).

Another important limitation of AIDS and STD prevention programs in schools is that they may fail to target homosexual and bisexual adolescents—a group that is at particular risk of HIV infection. One promising program for homosexual and bisexual adolescents is the University of Minnesota Youth and AIDS project (169). This program uses school personnel, social groups, and peer referrals to reach homosexual and bisexual males ages 14 to 21 so that they can receive individualized counseling on risk reduction, peer education, or referrals for psychosocial and medical services, and regular followup visits.

According to a 1990 evaluation of public school HIV education programs, the U.S. General Accounting Office (GAO) concluded that "CDC-led nationwide education efforts are not yet commensurate with the [HIV] epidemic's potential for disaster" (262a). GAO noted that, while two-thirds of the Nation's public school districts reported providing some formalized HIV education for students in the 1988-89 school year, such education was not offered at every grade level, "especially the upper grades, where the probability of sexual activity is highest" (262a). One of five HIV teachers surveyed by GAO[53] received no training; the training that teachers did receive was judged by GAO to be "often insufficient," that is, too brief and with limited coverage of important topics (262a). GAO found that CDC provided no guidance to districts on the appropriate length of teacher training in HIV topics, and that CDC-funded education departments did not collect from students essential planning and monitoring information needed to set program priorities and evaluate success (262a). Consistent with findings throughout this Report and elsewhere (e.g., 147a), the scarcity of monitoring information was held to be due to "a lack of staff and difficulty in obtaining community support to collect sensitive sexual and drug use data" (262a).

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[52] An important limitation of Kirby's study was that adolescents were not randomly assigned to sex education programs and control groups (111). In addition, results from the programs Kirby evaluated cannot be generalized to all sex education programs.

[53] The response rate for GAO's survey of 9,800 HIV teachers was 45 percent, with the highest response rate coming from nurses (262a). It is unclear whether non-nurse respondents received more training than nurse respondents; one would expect that nonrespondents would have received less training and been less involved in HIV education than respondents.

Education-Based Prevention Efforts in Community Settings

Education-based AIDS and STD prevention efforts in community settings are more likely than efforts in families or schools to reach adolescents who are out of school or on the streets; furthermore, efforts in community settings can support and reinforce prevention messages introduced within the schools (203).

A large number of education-based AIDS and STD prevention efforts involving health care practitioners, peers, churches, national and local organizations, and the media have been undertaken by many local communities throughout the country. Specific activities include teen street theater, "rap" and poster contests, distribution of print material, STD and AIDS hotlines, individual and group counseling, and media campaigns. The Latin American Youth Center in Washington, DC, distributed bumperstickers, had a poster contest, and enlisted adolescents to talk to other adolescents on radio programs (130). Several community-based AIDS education projects that target students and street youth have received Federal funds from the National Institute on Drug Abuse and CDC (240).

Very few of the large number of education-based AIDS and STD prevention activities in communities have been systematically evaluated to identify effective approaches and methods for preventing HIV infection and STDs among adolescents. Teen street theater (e.g., the Teen Teatro AIDS Prevention Project of the East Los Angeles Rape Crisis Center, El Teatro Juvenile De La Comunidad in McAllen, Texas),[54] "rap" contests, and comic books, for example, are often viewed as useful approaches for targeting racial and ethnic minority adolescents and runaway and homeless youth (22,34,126,128,130,173). Although these approaches may be especially effective because they involve adolescents as deliverers of the prevention message, no systematic evaluations have been completed. Measures of the success of these programs are limited to process measures (e.g., the number of adolescents who participate).

It is possible to use community settings to deliver intensive educational interventions. For example, Rotheram-Borus and her colleagues engaged 63 runaways and gay male adolescents in 4 New York City community agencies in a 10-session educational program that was based on cognitive-behavioral theory (e.g., the sessions were participatory and focused on specific behaviors) (175a). The intervention was more successful in increasing self-reported condom use during anal, oral, and vaginal intercourse than was the "state-of-the-art" 2-session intervention used as a comparison (175a). The intervention was only effective in the short term (i.e., 3 months) in reducing levels of sexual activity (175a). A brief one-time AIDS-specific education session with females in adolescent medical clinics was effective in increasing knowledge, but generally not effective in changing attitudes or increasing condom acquisition, except among those females who had already been using condoms and who were exposed to a videotape on condom use as well as a lecture by a health professional (171a). In this study condom acquisition was both encouraged and measured by providing participants with a coupon to exchange for a free condom at a local pharmacy; it did not measure actual condom use, but acquisition of a condom is a necessary precursor to use (171a).

Photo credit: Los Angeles Free Clinic

Approaches to AIDS education such as teen theater may be particularly effective because they involve adolescents as deliverers of the prevention message. However, there have been no systematic evaluations of their effectiveness.

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[54] In teen street theater productions, adolescent actors typically present a play that illustrates a difficult social situation that is overcome by using appropriate peer refusal and communication skills. Usually, the play is followed by a question-and-answer period between the audience and the actors.

Because many adolescents learn about public health problems such as drugs and AIDS through the media (135,163) and because the media appear to have played an integral part in changing people's behaviors in antismoking efforts, the reduction of cardiovascular disease, and the control of syphilis (203), many organizations have suggested that an expanded use of the media might be an effective approach in preventing HIV infection and STDs among adolescents (142,162,203).

Since 1987, CDC's National AIDS Information and Education Program has been conducting a major multimedia AIDS prevention effort, "America Responds to AIDS" (219). This multimedia effort targets the general population and various subgroups, including women at risk of AIDS and sexually active adults with multiple partners (219). One phase of CDC's AIDS prevention campaign, begun in May 1989, targets parents and adolescents who are racially and ethnically diverse and are of different age ranges (e.g., late-elementary and middle-school aged and junior- and senior-high-school aged) (183,218). This phase aims to promote communication between adults (including parents) and adolescents about HIV and AIDS, to encourage adolescents to adopt and maintain less risky sexual and drug use behaviors, and to make the public aware that certain adolescents are at risk for contracting HIV (183,218). English and Spanish television, print, and radio public service announcements were pretested on focus groups of parents and youth, ages 10 to 20 years. Additionally, CDC has developed an "AIDS Prevention Guide" to be distributed to adults having contact with adolescents (217,218). This guide provides facts about HIV and AIDS and ways for parents and other adults to talk comfortably with adolescents of all ages about HIV infection and AIDS (217).

For several reasons, including the difficulty of isolating the effects of any media campaign, the impact of CDC's AIDS prevention campaign on adolescents and their parents is not clear. Evaluation components include measuring the increase in the number of phone calls to the National AIDS Hot Line and the National AIDS Clearinghouse and testing adults' and students' knowledge, attitudes, and behaviors (134,183). As of May 28, 1990, over 1.1 million copies of the "AIDS Prevention Guide" had been distributed, and over 1 million calls to the AIDS hot line had been made (269). Unfortunately, information specialists at the AIDS hot line and clearinghouse are not permitted to ask callers' ages nor to ask whether callers have children (134,183, 269).[55] Furthermore, because the National Health Interview Survey does not survey most adolescents directly, it is not clear how many adolescents heard or saw the public service announcements.

Not surprisingly, individuals who have analyzed the effectiveness of mass media campaigns suggest that changing people's drug- and sex-related knowledge and attitudes is easier than changing risky behaviors (71,268). In order to be effective, messages must be repetitive, consistent, understandable, and supported by the community (71,268). In spring 1989, CDC's National AIDS Information and Education Program established the Applied Communication Research and Evaluation Branch to help evaluate future phases of the CDC's AIDS prevention campaign (134,183).

There are few mass media campaigns directly targeting adolescents for the prevention of STDs, as opposed to AIDS. Burroughs Wellcome Co., a pharmaceutical company based in North Carolina, in conjunction with several medical organizations,[56] began an innovative multimedia advertising campaign in July 1989 targeting sexually active adults (25,32). This campaign encourages sexually active adults ages 18 to 49 to check for the signs and symptoms of STDs (e.g., chlamydia, genital herpes, gonorrhea, genital warts, and syphilis) using a genital self-examination (25,32). Because the campaign was designed and tested to address the STD epidemic among the adult population, however, it is likely that a different program would be required to

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[55] CDC considers the hot line and the clearinghouse as services to the general public, not as sources of research (134). Recently, information specialists have been completing passive report forms after speaking to a caller. For example, hot line operators fill out forms based on information volunteered by the caller. In addition, operators may estimate various other types of information, for example, the caller's age (269). CDC is in the planning stages to get an Office of Management and Budget clearance to ask callers general questions related to particular campaigns, for example, have you seen the Public Service Announcements, and what part of the Public Service Announcements do you remember most? (269).

[56] The medical organizations are the American Academy of Dermatology, the American Academy of Family Physicians, the American College of General Practitioners in Osteopathic Medicine and Surgery, and the American Osteopathic Association (32).

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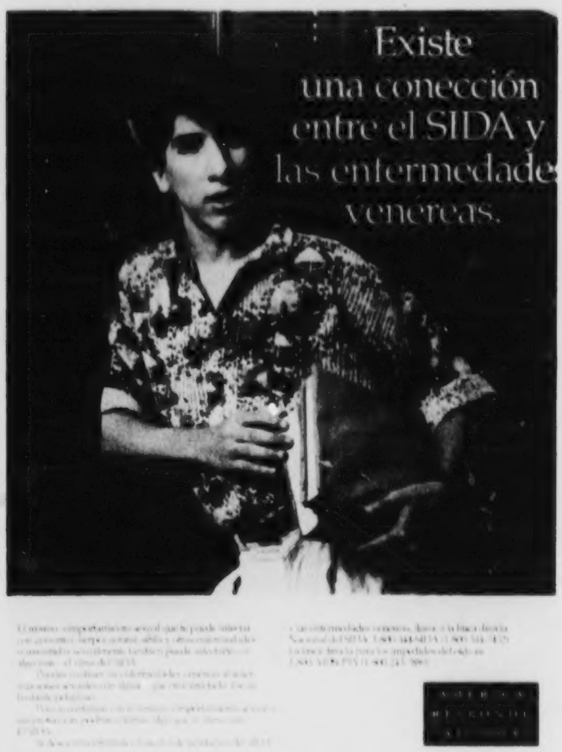

Photo credit: Centro del Control de las Enfermedades de los Estados Unidos

This poster is one of few efforts to focus on the prevention of STDs overall, in addition to the prevention of HIV transmission.

meet adolescents' needs (25).[57] Local media campaigns, such as Terrific, Inc.'s Teen AIDS Prevention and Risk Reduction Program in the District of Columbia, involve adolescents in community radio broadcasts as a method to encourage other adolescents to change risky sexual and drug-using behaviors (22,195). These campaigns have not yet been evaluated.[58]

One limitation in using television media for AIDS and STD prevention is that while certain adolescents identify television as their first and major source of AIDS information (135,163,274), others, such as runaway adolescents, homeless adolescents, dropouts, and hemophilia patients, either do not have access to television or view information presented on television as "biased and superficial" (155). For these groups of adolescents, other approaches are necessary.

AIDS and STD Prevention Efforts Other Than Those That Are Education-Based

Education-based AIDS and STD prevention efforts alone are a fairly passive approach to prevention. Such efforts rely totally on the recipient of the prevention message to initiate the suggested behavior change (e.g., abstinence, safer sex). Some education-based efforts are more informative than others, of course, but many are somewhat vague about effective courses of action. Vagueness sometimes arises because of limitations in time and space (e.g., on a poster), but sometimes prevention messages may be less than explicit in order to avoid offending some perhaps unintended recipients of a message (e.g., about specific safer sex practices). This section describes several prevention interventions that are designed to provide selected means for preventing AIDS or other STDs. These means include condom distribution, needle exchanges, and early diagnosis and treatment.

The prevention efforts described in this section can also be distinguished from the adolescent-specific education-based AIDS and STD prevention efforts described above in that they are directed at those individuals who are already engaged in activities that may put them at risk of HIV infection or STDs. Thus, they can be considered secondary prevention efforts.[59]

It is important to note that while prevention efforts such as those described below are designed to provide the means to help individuals at risk avoid contracting a disease or condition, targeted individuals still have to find out about the preventive measure and be motivated to use it. Thus, educational efforts designed to improve knowledge and change attitudes and behavior are a necessary component of a full prevention effort.[60]

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[57] An interesting feature of the Burroughs Wellcome campaign is the buying of commercial air time to show a 30-second genital self-examination commercial during afternoon programming in the 2 to 4 p.m. time slot and certain evening programs airing after 9:00 p.m. (25). In the past, OTA suggested that paying networks for air time may be an effective method for reaching a targeted audience for HIV prevention (203). However, because the primary method of evaluating the campaign focuses on the total distribution of genital self-examination instruction booklets (25), it will be difficult to determine if paid advertising is more effective in reaching an intended audience for HIV or STD prevention than public service announcements which rely on networks' volunteering air time.

[58] Grandma's House, a division of Terrific, Inc., is working with a consulting firm to develop future evaluation instruments for its HIV prevention efforts (196).

[59] *Secondary prevention* interventions are those that strive to shorten the course of an illness or condition by early identification and rapid intervention. Targets for secondary prevention interventions typically include populations at high risk of a particular problem.

For adolescents who are not abstaining from sexual intercourse or experimentation with drugs, the goal of AIDS and STD prevention efforts may be the elimination of risky sexual and drug-using behaviors.[61]

Condom Distribution Programs

Although the most effective method for preventing the transmission of HIV and STDs is to abstain from sexual intercourse, many U.S. adolescents do not abstain from sexual intercourse. For adolescents who cannot be persuaded to refrain from sexual intercourse, the use of latex condoms lubricated with nonoxynol-9 is the most effective method to lower the risk of HIV and STD infection (46,74,107, 148,172,180,222,234).[62]

In general, U.S. adolescents' knowledge about the effectiveness of condoms in preventing the transmission of HIV is substantial (7,83,95,155). Many adolescents' knowledge regarding the effectiveness of condoms in preventing STD infection, however, is minimal (see table 9-7).

Despite their high level of knowledge about the efficacy of condoms in preventing the spread of HIV, adolescents continue to be inconsistent condom users (94,95,109,155). The reasons include both perceived and real barriers to the use of condoms (38,43,94,95,171,265). Condom instructions written at high reading levels, for example, pose particular problems for adolescents who cannot read at those levels. Adolescents who do not regularly carry condoms or who believe that condoms reduce pleasure or are embarrassing to buy or use are highly likely to avoid using them (94,115). Another possible barrier to use may be adolescents' belief that their friends are not as supportive of condom use as they are themselves (7). Among 10th grade students surveyed in the National Adolescent Student Health Survey, for example, 94 percent agreed that sexually active people should use condoms. Somewhat fewer—81 percent—thought that their peers would agree. A study conducted by adolescents with the assistance of the Center for Population Options in 1988 found that it was difficult for adolescents, particularly females, to buy condoms at drug stores located in the Washington, DC area because of physical barriers (i.e., condoms are in places not readily located in stores, such as behind pharmacy counters) and unhelpful and judgmental store clerks (37). Because of these barriers and the inconsistent use of condoms by adolescents who are engaging in sexual intercourse, the actual effectiveness of condoms in preventing transmission of HIV and STDs may be lower than what is theoretically possible (273).[63]

CDC recommends that condoms and spermicides be available in any facility providing STD services, but the CDC guidelines do not specifically address the availability of condoms to adolescents (234). Currently, free condoms are being distributed to adolescents through various methods and at diverse locations, including clinics, sports areas, emergency rooms, bathrooms, bars, and service centers. In some places, condoms are placed in easily accessible locations so adolescents need not even ask for them (e.g., at Three-for-Free program sites in Maryland, Children of the Night in Hollywood, California, and at Condom Sense in Atlanta) (12,87,113,264). Two

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[60] Another broad strategy for prevention is called *health protection. Health protection* strategies are interventions related to environmental or regulatory measures that confer protection on large population groups. They do not require educational efforts to increase knowledge or change attitudes or behaviors. For example, limiting the overall spread of a disease through public health efforts can be considered a health protection strategy for the prevention of HIV infection and STDs among adolescents. This Report does not consider the effectiveness or potential effectiveness of strategies such as these on the adolescent population.

[61] Drug treatment programs for adolescents are discussed in ch. 12, ''Alcohol, Tobacco and Drug Abuse: Prevention and Services.'' The effectiveness of pregnancy- and drug-prevention efforts taking place in school-linked health centers (e.g., Lanier Clinic in Jackson, Mississippi), the community (e.g., The Door in New York City and Bridge Our Troubled Waters in Boston) and family planning clinics are discussed in ch. 10, ''Pregnancy and Parenting: Prevention and Services,'' in this volume and in ch. 15, ''Major Issues Pertaining to the Delivery of Primary and Comprehensive Health Services to Adolescents,'' in Vol. III.

[62] Data relating condom use to particular sexual practices such as anal and oral sex are very limited. Data from a small sample of sexually active, inner city black and Hispanic adolescent females attending an adolescent health center suggest that at least some adolescent females are less likely to use condoms during anal intercourse than during vaginal intercourse (102).

[63] For a discussion of adolescents' use of various birth control methods, see ch. 10, ''Pregnancy and Parenting: Prevention and Services,'' in this volume.

RAMSES
RAMSES
Super Thin
MAGNUM
MAGNUM
Super Thin

Photo credit: Office of Technology Assessment

There are a number of reasons why adolescents may be inconsistent or inefficient users of condoms, including lack of knowledge about how to use condoms, cost, and physical and social-psychological barriers to purchasing or otherwise obtaining condoms. In 1988, only about half of adolescent females ages 15 to 19 and their partners used condoms at first intercourse, and only one in five reported "current" use of condoms during sexual intercourse.

other efforts include a condom giveaway in the rock magazine *Spin* and free mail-order condoms to a small study sample of adolescent males ages 16 to 17 (80,113). Both of these programs were time-limited. The number of high schools distributing condoms through health services centers appears to be increasing, with distribution in selected school-linked health centers in high schools reported in Cambridge (Massachusetts), Los Angeles, and Miami (Florida) (123a). Following an impassioned debate in the city and among board of education members, New York City's public high schools are to begin distributing condoms on request to students (13a,69a). Some high schools in Canada have installed condom machines on school premises (46a).[64] In general, however, the distribution of free condoms to adolescents, even to those who are sexually active, appears to be the exception rather than the rule.[65]

Parents may be a more effective and appropriate source of condom information and distribution than schools, but it is not known how many parents provide condoms or discuss the need for them with their sexually active adolescent children.

To OTA's knowledge, few studies have evaluated the success of condom distribution programs. Very little is known regarding the impact of condom distribution programs on adolescents' attitudes or behavior. No evaluations of condom distribution programs to date have used reductions in the incidence of HIV infection and STDs as outcome measures (see table 9-10). Many factors (e.g., media, families, friends) may influence condom use, so evaluating the effect of condom distribution programs is particularly difficult.

A fear that facilitating access to condoms may encourage adolescents to have sex may make some people reluctant to support condom distribution. One recent study of 16- to 17-year-old males found that a pamphlet discussing STDs and pregnancy and the offer of free condoms did not increase adolescents' levels of reported sexual activity (113). That study also found that the offer of free condoms had no apparent impact in terms of changing the adolescents' attitudes related to sexual behavior or the use of condoms. It is important to note, however, that the offer of free condoms was made through the mail and through telephone followup. This seems a

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[64] Apart from the controversy surrounding introducing condoms into the schools (13a,46a), anecdotal information from the Canadian experience suggests that making condoms available is not as simple an answer to STD and pregnancy prevention as it may seem at first. School officials in Canada debated about the tradeoffs in quality and cost of the condoms to be made available in the schools, and at least one student informed school officials that she had become pregnant, ostensibly because of a torn condom, raising concerns about liability in the minds of the officials. As discussed in ch. 10, "Pregnancy and Parenting: Prevention and Services," in this volume, adolescents typically experience contraceptive failure rates (in terms of unintended pregnancy) higher than the theoretical failure rates expected among women who rely on contraception consistently and correctly during each act of intercourse: for U.S. females under age 20 who participated in the 1982 National Survey of Family Growth, the percentage who experienced an unintended pregnancy in the first year of using condoms was 13.3 percent for whites and 22.3 percent for nonwhites; this compares to a theoretical failure rate for condoms among women who use them perfectly of only 2 percent (see table 10-7 in ch. 10 in this volume). The failure rate of condoms in terms of preventing STDs has not been calculated for adolescents. The evidence on unintended pregnancies and the Canadian experience with condom distribution suggests that education about condom use is essential to making condoms an effective contraceptive or STD-protection device. In New York, condoms are to be distributed in a "health resource center" containing information on HIV and AIDS, STDs, and other health issues (69a). The health resource site is to be staffed at least 10 periods each week at a variety of times during the school day (69a).

[65] Systematic data are unavailable. For example, in its surveys of school-based clinics, the Center for Population Options collects information about the number of schools that dispense birth control methods, but the survey does not ask specifically about dispensing condoms (see ch. 15, "Major Issues Pertaining to the Delivery of Primary and Comprehensive Health Services to Adolescents," in Vol. III).

Table 9-10—Studies Evaluating Selected Condom Distribution Programs for the Prevention of HIV Infection and Other STDs Among Adolescents

Study[a]	Study population	Intervention(s) and Outcome measure(s)	Research design and year data collected	Results
Arnold, 1973	NA	*Interventions:* Condoms were distributed in pool halls, barber shops, a restaurant, and a grocery store through a summer youth program. More condoms were distributed during the week than on the weekends. Participants went to sites near their homes. *Outcome measures:* Female fertility rates and number of distributed condoms	*Research design:* Descriptive. Male outreach workers in North Carolina organized condom sites. Fertility rates of target area and nontarget areas were compared. Condom use over the study year was tracked. *Year data collected:* Late 1960s	Fertility rate of black adolescent females ages 10 to 19 declined 19% compared with no decrease in nontargeted areas. Site of condom distribution did not appear to make a difference.
Kirby, Harvey, Claussenius, et al., 1989[b]	Low-income 16- to 17-year-old males	*Intervention:* A cover letter, pamphlet discussing STDs and pregnancy and methods of birth control, and an order coupon for free condoms were mailed to adolescent males throughout the country. Targeted males could order free condoms. *Outcome measures:* Performance on knowledge, attitude, and behavior telephone survey	*Research design:* Experimental design. Males were randomly assigned to an intervention (N = 984) or control (N = 1,033) group. 1,000 males from both groups were randomly selected to be contacted by telephone 5 weeks after the intervention; those who had ordered condoms were telephoned again 7 months later. Adolescents from Mountain and Pacific States were underrepresented. Completion rate for the interviews was 53 percent.	Of those receiving the material, 9 out of 10 said they read the pamphlet, and half discussed the pamphlet with their parents. Knowledge score increases were small but significantly higher for the intervention group (83% compared with 80%). Pamphlet and offer of free condoms appeared to have no impact on changing attitudes related to sexual behavior. The offer of free condoms did not appear to increase levels of sexual intercourse or increase the possibility of using condoms.
Kirby, Waszak, and Ziegler, 1989	Students attending school-based clinics at 1 of 6 sites around the country	*Intervention:* School-based clinic available in the school *Outcome measures:* Use of condoms	*Research design:* Quasi-experimental involving comparison groups for 4 schools and pre-post surveys (before and 2 years after clinic opening) for the remaining 2 clinics. Pre- and post-use of condoms specifically compared in only one site. *Year data collected:* 1989	Condom use increased from 26% to 48%. Remark: Numerous factors could have accounted for the increase in condom use: location in a city at high risk for HIV-infection, intensive AIDS education programs in the school, use of sports and health physicals to talk about condom use, distribution coupons for free condoms.

Continued on next page

Table 9-10—Studies Evaluating Selected Condom Distribution Programs for the Prevention of HIV Infection and Other STDs Among Adolescents—Continued

Study[a]	Study population	Intervention(s) and Outcome measure(s)	Research design and year data collected	Results
Kjoller, Hansen, and Segest, 1989	28 9th grade classes in Copenhagen, Denmark	*Intervention:* None; students questioned about desirability of condom distribution, and about current condom use *Outcome measures:* Performance on a structured attitude and behavior questionnaire	*Research design:* Classes were selected by means of a lottery. *Year data collected:* November-December 1987	34% of the students had had sexual intercourse. 90% wanted to receive free condoms, and half preferred getting condoms from the pharmacy, school, or their own doctor. 40% of the students had not used a condom during their last sexual intercourse experience.
University of Maryland, no date	Sexually active general population	*Intervention:* Over 170 sponsors distributed condoms along with directions for proper use in quantities of 3 to 15 in 371 sites. *Outcome measure* Number of condoms distributed	*Research design:* The Three-for-Free program of the Division of Family Planning, Maryland State Department of Health and Mental Hygiene is sponsored by county health departments, college and university health centers, community clinics, the Boys and Girls Club, and the Baltimore City Health Department. Program participants pick up condoms in an anonymous fashion without being questioned. Counseling or discussion with a health educator was not required. *Year data collected:* 1986-88	In 1988, approximately 1,870,000 condoms were distributed around the State compared with close to 386,000 in 1987 and 33,230 in 1986.

KEY: NA = not available.

[a] Full citations are listed at the end of this chapter.

[b] The clinics are located in Gary, Indiana; Muskegon, Michigan; Jackson, Mississippi; Dallas, Texas; Quincy, Florida; and San Francisco, California.

SOURCE: Office of Technology Assessment, 1991.

rather indirect way to distribute condoms, although the study and program designers did have the advantage of being able to followup participants.

The results of a Danish study suggest that some adolescents may need more than easy access to condoms for them to use condoms (116). Kjoller and her colleagues found that while students thought that the availability of free condoms would increase use, many wanted condoms available where they could get advice and individual guidance (116). Given that the mere availability of condoms may not increase use, innovative educational programs may be needed to address adolescents' ultimate decision to use condoms.

Programs seeking to increase condom use among adolescents must address the barriers that adolescents perceive as sufficient to affect their decision to use condoms. Networks will agree to air radio public service announcements about the effectiveness of condoms in preventing AIDS (143), but they have been reluctant to allow commercial advertising of condoms, particularly advertising targeted to adolescents (113). In countries other than the United States, social marketing techniques have been used to advertise condoms for STD prevention.[66]

Needle Exchange and Bleach Distribution Programs for Adolescents Using IV Drugs[67]

Virtually nothing is known about whether adolescents who use IV drugs have changed their behavior in response to AIDS. Several studies show that many adult drug users modified aspects of their drug behavior to avoid getting AIDS even prior to the implementation of official AIDS prevention programs (60,203). In fact, *adult* IV drug users appear to be changing their drug use behaviors more frequently than they are changing risky sexual behaviors (58,203).[68] These data from adults, however, cannot be generalized to adolescent IV drug users.

Currently, there are two major types of programs for the prevention of HIV infection among IV drug users: needle exchange programs and bleach distribution programs. Forty-four States and the District of Columbia prohibit the use, sale, or distribution of hypodermic devices, and 21 States regard the furnishing of such devices to adolescents under age 18 as a felony (277). Despite strict laws, three cities (New York City; Boulder, Colorado; and Tacoma, Washington) have established needle exchange programs (277).[69] Needle exchange and bleach distribution programs appear to complement each other (60,143). However, the available evidence suggests that these adult programs are being used by older, more experienced drug users and not by younger, less experienced drug users (60,158,266).

It is not only IV drug use that presents an AIDS risk for adolescents. Use of other drugs may lower adolescents' (and adults') inhibitions about engaging in sex. Because drug use has been associated with sexual activity (141), it is particularly important for adolescents that efforts for the prevention of AIDS and STDs address both risky sexual and drug-using behavior.

Early Diagnosis of Adolescents With HIV Infection and STDs

An important component of controlling the spread of HIV and STDs among the adolescent population is effective diagnosis and treatment of those adolescents infected with HIV or with STD agents who are either symptomatic or asymptomatic (234). One of the major obstacles for adolescents seeking immediate treatment is that many adolescents do not know and do not understand that people infected with HIV or STD agents may be asymptomatic for a period of time (18,67,88,149,176,234).

Some STDs (e.g., herpes) and HIV infection are not curable (234). Nevertheless, early treatment for all STD and HIV infections is necessary for several

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[66] Kotler and Zaltman define *social marketing* as "the design, implementation, and control of programs calculated to influence the acceptability of social ideas and involving considerations of product planning, pricing, communications, distribution, and marketing research" (119). Black and Farley note that social marketing is different from health education because specific products, such as condoms, rather than abstract ideas (e.g., disease prevention) are promoted (19).

[67] For a discussion on the number of adolescents who are currently using IV drugs, see ch. 12, "Alcohol, Tobacco, and Drug Abuse: Prevention and Services," in this volume.

[68] It is not clear why few IV drug users practice safe sex practices (59,143). Among other reasons immediately related to drug effects, some have suggested that IV drug users have difficulty in discussing sexual relationships because they fear the breakup of the relationship (58,59,203).

[69] Under New York's public health laws, the State Health Commissioner can authorize groups or individuals to possess needles if he deems such possession necessary for the public health (166,277). New York City's needle exchange program was limited to one distribution site, and was discontinued after a short time.

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reasons. First, many STDs (e.g., chlamydia) can be cured with appropriate treatment (176), but if left untreated, can result in infertility, ectopic pregnancy, PID, urethritis, gonococcal arthritis, chronic pelvic pain, mental retardation, and even death[70] (18,177,272,234). Second, early treatment of HIV infection with zidovudine[71] has been shown to prolong the lives of patients who are seropositive for HIV and have not yet developed symptoms (193). (In fact, one important argument in support of testing people for HIV infection is that more HIV-infected people may be able to participate in clinical trials of experimental treatments (67).) Finally, given the high rate of sexual activity among the adolescent population, early treatment can prevent the spread of STDs to sexual partners.

Almost all States have enacted legislation specifically authorizing minors to consent (without parental approval) to health services related to STDs or "venereal diseases."[72] Forty-two States have statutes allowing minors of any age to consent to STD services.[73] [74] Despite the availability of STD treatment services, adolescents are slow to seek treatment for several reasons. First, they may not be aware of STDs or their symptoms and may not believe that they could be infected (7,186,160). Data from the National Adolescent Student Health Survey indicate that from 40 to 60 percent of 8th and 10th grade adolescents did not recognize various signs and symptoms of STDs (see table 9-7).[75] Further, many adolescents indicate they would avoid health services if parental involvement were required for care (88). A large proportion of 8th and 10th grade adolescents in the 1987 National Adolescent Student Health Survey (76 percent) incorrectly believed that the public health department would inform their parents of their infection with an STD, and most (79 percent) thought that parental permission would be required for minors to be treated in clinics[76] (see table 9-7). This level of misinformation was higher among younger adolescents (7).

Shame and embarrassment may be factors in avoiding care. Students in the National Adolescent Student Health Survey were more concerned about their friends finding out they had an STD than about their parents finding out (74 and 49 percent, respectively) (7). Other reasons why adolescents are slow to seek treatment for an STD include lack of transportation, difficulty in paying for treatment, and not knowing where to go for medical care (7).

Many adolescents may not be aware that treatment for STDs is free in certain locations, such as in some public health clinics. Some public health programs use a sliding fee scale, so that adolescents' charges will be based on their personal income, not on their families' income (10). Although data on the availability of services for STDs are scarce, available information suggests that, in some communities, adolescents' concerns about the unavailability of free treatment services may be well founded. A 1990 survey by the National Association of County Health Officials (NACHO) found that 27 percent of local public health departments do not actively provide STD services (146a).[77] Generally, local health departments serving smaller populations, and having fewer full-time employees, were less likely than larger local health departments to provide STD services (146a). The availability of STD services varied by region, as well. Only 20 percent of local health departments in DHHS Public Health Service

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[70] Generally, PID and syphilis account for the most deaths due to STDs (84). However, the latest national data available indicate that no adolescents between the ages 10 and 19 have died of syphilis (243). No numbers are provided for PID.

[71] This drug was formerly called azidothymidine (AZT) (289). It is also called Retrovir®.

[72] For a discussion of minors' rights, see ch. 17, "Consent and Confidentiality in Adolescent Health Care Decisionmaking," in this volume.

[73] A few States, which have no statute authorizing a minor to consent to health services for STDs, have a statute authorizing minors to consent to diagnosis and treatment for "infectious, contagious, communicable, and reportable" diseases or some variant thereof (see ch. 17, "Consent and Confidentiality in Adolescent Health Care Decisionmaking," in Vol. III).

[74] For further discussion of consent in adolescent health care decisions, see ch. 17, "Consent and Confidentiality in Adolescent Health Care Decisionmaking," in Vol. III.

[75] Proportions include those who responded incorrectly as well as those who answered "Don't know."

[76] The type of clinic (e.g., STD or public health) is not defined in the National Adolescent Student Health Survey (7).

[77] A relatively broad definition of a local public health department was used by NACHO: "an administrative or service unit of local or State government, concerned with health, and carrying some responsibility for the health of a jurisdiction smaller than the State." Local health departments were identified using three sources, including the U.S. Conference of Local Health Officers and NACHO mailing lists, and contacts with each State health agency. In total, 2,932 such departments were identified and surveyed. The overall response rate of 77 percent (2,258 departments) was quite respectable for such a survey, but 11 States had response rates between 50 and 80 percent of surveyed departments, and 5 States had response rates of under 50 percent of surveyed departments (146a).

Region 1 (Connecticut, Maine, Massachusetts, New Hampshire[78]) reported providing STD services, compared to almost 100 percent providing STD services in Regions 3 (District of Columbia, Maryland, Pennsylvania, Virginia, and West Virginia[79]), Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee), and Region 9 (Arizona, California, Nevada[80]) (146a). The findings of the NACHO survey should be viewed with some caution, however. Local health departments were only queried as to whether they were "active" in providing STD services to individuals; the level and type of such activity was not requested (146a).[81]

Services and Interventions for the Treatment of AIDS and Other STDs

CDC has developed guidelines for treating and screening people infected with STDs and recommends that appropriate care for treating STDs include obtaining a medical and behavioral risk assessment (including questions regarding same gender sexual contact), doing a physical examination, laboratory diagnostic services, counseling and education (appropriate to age, race, sex, socioeconomic status, and interpersonal skills), and identifying sex partners (65,234,242a,263). CDC also recommends that people seeking health care unrelated to STD infection be assessed for STD risk. If an individual reveals that he or she has STD symptoms, that individual should undergo a physical exam and appropriate laboratory tests (234). Recommended treatment regimens vary depending on the STD, and some regimens dictate that clients take medication several times a day for up to a week (234). Although the CDC guidelines note that those people who are under age 25 are at greatest risk of infection, they do not provide specific guidelines (e.g., appropriate dosages, length of time) for treating STD-infected adolescents.

Photo credit: Education Week

In a recent set of guidelines for prevention and management of pelvic inflammatory disease, the Centers for Disease Control (CDC) recommended that "any health care program that serves adolescents should either provide STD evaluation and treatment or should be able to refer teenagers rapidly to a facility that offers such care." CDC further suggested that clinics located in schools can provide "effective, convenient STD clinical services for sexually active adolescents."

CDC did include specific mention of adolescents in its April 1991 guidelines for prevention and management of PID (242a). In CDC's publication, adolescent-specific guidelines spoke to the organization of STD services for adolescents, rather than to the clinical management of PID. These new CDC recommendations note that adolescents are "highly vulnerable" to acquiring STDs. Thus, CDC recommends that "any health-care program that serves adolescents should either provide STD evaluation and treatment or should be able to refer teenagers rapidly to a facility that offers such care" (242a). Further, it suggests that "school-based clinics can provide effective, convenient STD clinical services for sexually active adolescents" and recommends that regular, consistent use of condoms by all sexually active adolescents be encouraged by health care providers and presumably by others (242a).

The development of STD treatment guidelines specifically for adolescents is important for several reasons. Because adolescents and adults metabolize drugs differently, adolescents may require different dosages (90,184). Adolescents who receive adult dosages of drugs to treat STDs may be undertreated in some cases and overtreated in others. The end result of underdosage may be the evolution of resistant strains of STD organisms (278). Although adolescent compliance rates with STD treatment regimens have not been studied extensively (16), it has been suggested that health care providers consider the record of poor compliance and low return visits with other therapies in choosing an STD therapy (10,152). A study from Baltimore determined that only 54 percent of female adolescents and 33 percent of male adolescents kept their followup appointments for STD care (40). This finding may reflect medical practitioners' failure to provide clear, explicit instructions to patients to return for a visit in more than half of observed encounters (122).

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[78] Rhode Island and Vermont are also part of Region 1, but they had no local health departments as defined in the NACHO report.

[79] Delaware is also part of Region 3, but Delaware had no local health departments as defined in the NACHO report.

[80] Hawaii, the U.S. Trust Territories, American Samoa, Guam, and the North Mariana Islands are also part of Region 9, but Hawaii had no local health departments as defined in the NACHO report, and the scope of the report was limited to the continental United States, Alaska, and Hawaii.

[81] Fifty-seven percent of local public health departments responding to the NACHO survey reported that they provided counseling and testing for AIDS (146a). Although more local public health departments reported providing STD services than AIDS testing and counseling, the same pattern with respect to size of the population served and number of full-time employees that was found for STD services was found for AIDS testing and counseling (146a).

Attitudinal studies of adolescents have suggested, that clinician friendliness, understanding, and willingness to take their time are important to adolescents' appointment-keeping behavior and compliance with an STD treatment regimen. In one study, patients who expressed satisfaction were much more likely to keep future medical appointments than were patients who were dissatisfied (124). In another study, clinicians who were skilled in interacting with adolescents promoted better patient compliance (10). On the basis of their clinical experience, Bell and Hein suggest that single dose regimens work best for adolescents because they ensure compliance as well as confidentiality (16). For some STDs, chlamydia for example, only multiple dosage regimens are possible (117).

As of 1989, zidovudine was the only drug approved for the treatment of AIDS and HIV infection (21,50), although dideoxyinosine (DDI) has been approved under special circumstances for use in adolescents (78). Little is known about how zidovudine works in adolescents compared to adults or children (90,209). Still, many clinicians prescribe zidovudine to adolescents with AIDS or HIV infection (90).[82] There are currently no specific guidelines available on treating adolescents with HIV infection or AIDS (e.g., guidelines on appropriate drug dosages, how often drugs should be administered, toxicity levels, appropriate laboratory and neuropsychological assessments) (90,184).

Clinical trials of new drugs are sponsored by the Federal Government, drug companies, or private research organizations to test potentially effective drugs in volunteers, who include people with HIV infection but no symptoms, AIDS-related complex, or people with AIDS. Traditionally, the Food and Drug Administration has required that drugs be tested in three sequential phases before others outside the trials can receive the treatment (see table 9-11) (260). AIDS clinical trials were originally established for adults over age 18 and then for children and early adolescents ages birth through 13 years (91a). Adolescents between the ages of 13 and 17 have only recently been made eligible for enrollment in clinical trials for all kinds of drugs, including zidovudine (90,184,254). Often, adolescents are included in clinical trials for adults over age 18 (258). As of August 16, 1989, adolescents in various age groups could participate in 115 Federal clinical trials (259).[83] In almost half of these trials, however, only 18-year-olds were eligible to participate (259). Adolescents are also eligible to participate in over 35 nonfederally-funded trials (8).

Eligibility for trials, however, does not ensure access. Because adolescents tend not to use the traditional health care system and because consent and confidentiality issues are central,[84] adolescents are not actively sought to be included in trials (90,184). As of October 5, 1989, only 47 adolescents ages 12 to 21 having various stages of infection were involved in federally sponsored AIDS clinical trials (see table 9-12).[85] Of the 47 participants, 44 (94 percent) were male, and 3 (6.4 percent) were female. Forty-three (92 percent) were white (254).

Many legal issues surface regarding adolescents and their involvement in clinical trials. Currently, adolescents under age 18 must get permission from a parent, legal guardian, or person with power of attorney before entering federally sponsored trials (259). While emancipated minors can give consent for participation in trials (75), the issue of consent is

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[82] Until the Food and Drug Administration approved zidovudine for use in children and adolescents, clinicians faced liability concerns (75). Such concerns may recur if another drug is found to be effective in treating HIV infection and AIDS.

[83] These trials are not adolescent specific but group adolescents and adults or adolescents and children together.

[84] For further discussion of these topics, see ch. 15, "Major Issues Pertaining to the Delivery of Primary and Comprehensive Health Services to Adolescents" and ch. 17, "Consent and Confidentiality in Adolescent Health Care Decisionmaking," in Vol. III.

[85] Anecdotal evidence indicates that most parents of infected adolescents found out about trials through their physicians (75).

Table 9-11—Steps in AIDS Drug Testing

Type of trial	Range in number of patients	Length	Purpose	Method
Phase 1	20 to 100	Several months	To see if drug is safe	All patients get the drug being tested.
Phase 2	Up to several hundred	Several months to 2 years	To test effectiveness and short-term safety	In phases 2 and 3, doctors compare results for two randomized groups; the first gets the drug being tested; the second gets another drug, or no drug (placebo).[a]
Phase 3	Several hundred to several thousand	1 to 4 years	To test safety, effectiveness, dosage level	

[a] Currently, very few clinical trials of experimental AIDS drugs use placebos.

SOURCES: U.S. Department of Health and Human Services, Public Health Service, National Institutes of Health, National Institute of Allergy and Infectious Diseases, "AIDS Clinical Trial: Talking It Over," NIH Pub. No. 89-3021, Bethesda, MD, August 1989; U.S. Department of Health and Human Services, Public Health Service, National Institutes of Health, National Institute of Allergy and Infectious Diseases, "Where Do AIDS Drugs Come From?" Bethesda, MD, no date.

Table 9-12—Sex, Race, and Ethnicity of the 47 Patients Ages 12 to 21 Involved in Federally Sponsored AIDS Clinical Trials, October 5, 1989

Patients	Percent	Count
Sex[a]		
Male	93.6%	44
Female	6.4	3
Race		
White	91.5	43
Black	6.5	3
Other	2.1	1
Ethnicity		
Hispanic	17.0	8
Non-Hispanic	83.0	39

[a] The large proportion of males is due primarily to the large proportion of adolescent males with hemophilia involved in clinical trials.

SOURCES: U.S. Department of Health and Human Services, Public Health Service, National Institutes of Health, Bethesda, MD, unpublished data on patients involved in federally sponsored AIDS clinical trials, Bethesda, MD, October 1989; and D. Sondheimer, Coordinator, Adolescent and Maternal AIDS Branch, Center for Research for Mothers and Children, National Institute of Child Health and Human Development, National Institutes of Health, Public Health Service, U.S. Department of Health and Human Services, Rockville, MD, personal communication, Dec. 28, 1989.

not clear regarding young people involved in the foster care, child welfare and prison systems. Although no systematic data have been collected, these adolescents rarely seem to participate in clinical trials (75).

As discussed throughout this Report, there are not many health centers that are geared to the needs of adolescent patients in general.[86] According to Hein, there is in addition a serious shortage of health personnel knowledgeable about adolescents' HIV infection and a scarcity of programs serving high-risk and HIV-infected adolescents (91a). Two programs, funded as part of the Pediatric AIDS Health Care Demonstration Project of the Health Resources and Services Administration in DHHS, are developing new standards for comprehensive medical and social services for HIV-infected adolescents (91a). In the Montefiore Adolescent AIDS Program in New York City, a multidisciplinary team provides a comprehensive range of medical and psychosocial evaluation and services for individuals age 13 to 21 (91a). The program reaches out to bring at-risk and infected individuals in for services; in turn, the program refers patients out of the program to agencies that can provide nonmedical services such as housing or coordinate care for adolescents who are being cared for by multiple agencies (91a). The program is also developing and evaluating new strategies for behavior change in at-risk and infected adolescents (91a). A similar pediatric AIDS health care demonstration project is funded by DHHS to serve high-risk and infected adolescents in Los Angeles (91a). As Hein notes, although these programs are located in high-risk areas for adolescent HIV infection, together they touch only some of the at-risk and HIV-infected adolescents in the United States (91a).

The number of adolescents diagnosed with AIDS at present is small, but the apparent inadequacy of prevention efforts may mean an increase in the number who become HIV infected. This makes the existence of barriers to treatment such as the lack of clinical trials specific to adolescent dosages, and the limited access to AIDS clinical trials by adolescents generally (especially by black and female adolescents), exceedingly important to address. Unfortunately, no mechanism has been set up so that adolescent health care practitioners can participate in the AIDS Clinical Trials Group, which is the consortium of federally sponsored centers carrying out trials (90,157).

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[86] See especially, ch. 15, "Major Issues in the Delivery of Primary and Comprehensive Health Services to Adolescents," in Vol. III.

Major Federal Programs Related to HIV Infection, AIDS, and Other STDs

All levels of government—Federal, State, and local—have taken on some responsibility for controlling the spread of HIV infection, AIDS, and STDs within the adolescent population. Within the Federal Government, the primary responsibility rests with DHHS, particularly the Public Health Service. Federal support for AIDS- and STD-related activities is provided through block grants to the States and through funding for research and demonstration projects.

Federal support to States for AIDS- and STD-related activities is provided through block grants under Title V of the Social Security Act (maternal and child health services block grants) and Title XX of the Social Security Act (social services block grants). States are given wide discretion in determining what services to support with block grant money and in determining which groups should be eligible for services. States use portions of their block grant money to support AIDS- and STD-related services for all age groups, including adolescents, although the exact amounts are difficult to determine. Reporting requirements from the States to DHHS are minimal.[87]

DHHS funds demonstration and research projects related to AIDS and STDs. DHHS' HIV/AIDS and STD-related projects that included or targeted adolescents 1989-90 are listed in table 9-13. Most of the projects include adolescents as part of a larger population, but some target adolescents specifically.

According to information collected in OTA's survey of Federal agencies involved in adolescent health,[88] the Public Health Service and other agencies within DHHS typically spend no more than 10 percent of their budgets on adolescent-specific activities. Most of the funds for adolescent-specific activities are spent on programs and projects related to the consequences of adolescent sexual intercourse. As table 9-13 illustrates, DHHS agencies generally give greater emphasis to projects related to HIV infection and AIDS than to projects related to traditional STDs. This emphasis is not surprising given the fact that DHHS has identified AIDS as the Nation's highest health priority (214). According to OTA's survey, DHHS agencies spent over $150 million in fiscal year 1990 supporting AIDS- and STD-related efforts—including research, prevention, service, and treatment activities—that target adolescents (207,208,214,227,251,257,258).

AIDS and STD prevention, treatment, and research activities that include or target adolescents and are being supported by DHHS are discussed further below.

Federal Programs Related to AIDS and STD Prevention

DHHS supports numerous preventive intervention and research efforts to control the spread of HIV infection and STDs among a larger, more general population receiving Federal funds. This approach may increase the types of AIDS and STD preventive interventions available to adolescents but limit the appropriateness and usefulness of these interventions for adolescents. The National Institute on Drug Abuse within the Alcohol, Drug Abuse, and Mental Health Administration, for example, has supported many studies of preventive interventions for HIV infection relative to drug use and sexual behaviors; however, few studies of preventive interventions have focused on drug use and sexual behaviors among adolescents, and data from mostly adult participants cannot be generalized to adolescents (215). The Division of Sexually Transmitted Diseases and HIV Prevention within CDC's Center for Prevention Services supports partner notification efforts and screening for STDs at various locations (e.g., family planning clinics, outpatient obstetrics-gynecology clinics) as major approaches for identifying people who are potentially infected with STDs (117). If issues in partner notification efforts for

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[87] Until recently, for example, States were required only to report intended use of Title XX social services block grant funds to the Secretary of DHHS (200). The Family Support Act of 1988 (Public Law 100-485) required States to begin to report detailed information on services actually funded.

[88] For a more in-depth discussion of the Federal Government's activities related to adolescent health and a description of OTA's survey, see ch. 19, "The Role of Federal Agencies in Adolescent Health," in Vol. III.

Table 9-13—U.S. Department of Health and Human Services HIV/AIDS- and STD-Related Projects and Grants That Include or Target Adolescents, 1989-90[a]

Agency	Demonstration or research project grants that include or target adolescents[b]	Includes adolescents	Targets adolescents
Office of Human Development Services (OHDS)	*HIV Prevention:* Interagency agreement with the Public Health Service to mobilize national resources for youth with HIV infection and AIDS-related complex.		X
Public Health Service (PHS) Alcohol, Drug Abuse, and Mental Health Administration (ADAMHA):			
• National Institute on Drug Abuse (NIDA)	*HIV Prevention and Related Research:*		
	1. Five grants focusing on HIV preventive intervention strategies that promote changing risk-related behaviors in minority, adolescent, and homeless women (213).		X
	2. AIDS Comprehensive Community Outreach Demonstration Projects: develop effective preventive strategies for reaching IV drug users not in drug treatment and their sexual partners (203).	X	
	3. AIDS Targeted Outreach Demonstration Contracts: focusing on IV drug users (203).	X	
	4. Eleven Prevention-Intervention Studies ranging from on-the-street contact to multiple skills training sessions (213).	X	
	5. Multimedia Cocaine Abuse Prevention Campaign: radio, print and television public service announcements to help prevent cocaine use among older adolescents and young adults (213).		X
	6. AIDS and its Behavioral Causes: Children's Knowledge and Emotions: research that is developmentally based and studies 6- to 12-year-old children's knowledge, attitudes and feelings related to AIDS, sexuality, and substance abuse (see NIMH and NICHHD also) (262).	X	
• National Institute of Mental Health (NIMH)	*HIV Prevention and Related Research:*		
	1. AIDS extramural grants to the HIV Center for Clinical and Behavioral Studies and the Center for AIDS Prevention Studies: HIV prevention efforts targeting adolescent students, sex offenders, runaways, and sexually active adolescent females ages 14 to 20 (203).		X
	2. Multisite, multipopulation studies: test behavioral interventions to stop the spread of HIV infection (1).	X	
	3. AIDS and its Behavioral Causes: Children's Knowledge and Emotions: research that is developmentally based and studies 6- to 12-year-old children's knowledge, attitudes and feelings related to AIDS, sexuality, and substance abuse (see NIDA and NICHHD also) (262).	X	
Centers for Disease Control (CDC): • Center for Chronic Disease Prevention and Health Promotion			
—Division of Adolescent and School Health	*HIV Prevention:*		
	1. Cooperative agreements with 20 national, 55 State, and 16 local education agencies: help implement effective programs of school health education to prevent the spread of HIV (227).		X
	2. Technical assistance to State, territorial, and local departments of education: development and implementation of an anonymous self-administered questionnaire to high school students about their HIV-related knowledge and behaviors (231).		X
	HIV and STD Prevention: Assisting the Division of Reproductive Health within CDC's Center for Chronic Disease Prevention and Health Promotion in developing the Youth Risk Behavior Surveillance System: will periodically measure changes in health risk behaviors, including drug use and sexual intercourse that can result in AIDS and STDs (108,227,231).		X

Continued on next page

Table 9-13—U.S. Department of Health and Human Services HIV/AIDS- and STD-Related Projects and Grants That Include or Target Adolescents, 1989-90[a]—Continued

Agency	Demonstration or research projects/grants that include or target adolescents[b]	Includes adolescents	Targets adolescents
• Center for Infectious Diseases —Division of HIV/AIDS	*HIV Prevention and Related Research:*		
	Research and prevention projects: study HIV prevalence and risk factors for adolescents attending clinics in Bronx, New York, and Washington, DC (227)		X
• Center for Prevention Services —Division of Sexually Transmitted Diseases and HIV Prevention	*HIV Prevention:*		
	1. AIDS Community Demonstration Projects: evaluate strategies for preventing HIV transmission (5 out of 7 target school-aged youth) (240).		X
	2. Cooperative Agreements for Minority Community-Based Human Immunodeficiency Virus (HIV) Prevention Projects.	X	
	STD Prevention and Related Research:		
	1. Partner notification and screening efforts to reach infected individuals, including adolescents, at risk for STDs (117).	X	
	2. Development and review of STD curricula in the schools (117).		X
	3. Grants and cooperative awards to 10 STD Prevention/Training Centers: train professionals, physicians-in-training, and other staff of STD Control and HIV Prevention Programs in diagnosis, management, prevention, patient counseling, and standards of care for STDs and HIV infection (55 FR 7570,227).	X	
	4. National STD Hotline (117).	X	
	5. Preventive Health Services-Sexually Transmitted Diseases Research, Demonstration, and Public Information and Education grants: develop, improve, and evaluate innovative approaches to the clinical care of STDs and study the role of health behaviors in transmitting STDs (55 FR 17308).	X	
• National AIDS Information and Education Program (NAIEP)	*HIV Prevention:*		
	1. Multimedia "America Responds to AIDS" campaign phase targeting adolescents and parents: promote communication about HIV and AIDS between adults and adolescents, encourage adolescents' adoption of less risky behaviors, and increase the general public's awareness of adolescents and AIDS (183,218).		X
	2. National AIDS Hotline.	X	
	3. National AIDS Clearinghouse.	X	
Health Resources and Services Administration (HRSA):			
• Bureau of Maternal and Child Health	*AIDS Treatment and Related Research:*		
	1. Subacute Care Demonstration Project Grants: provide medical care and treatment to HIV infected individuals (55 FR 12918).	X	
	2. AIDS Regional Education and Training Centers.	X	
	3. Community and migrant health centers.	X	
	4. Pediatric AIDS Health Care Services Demonstration Projects: meet the needs of HIV infected children and adolescents by providing comprehensive services through the collaboration of community agencies (100).	X	
	5. Pediatric AIDS Comprehensive Center Demonstration Projects: form a consortia to provide services, conduct research, and provide training to professionals, volunteers, and other individuals working with pediatric AIDS populations (100).	X	
	6. National Issues of High Priority in Pediatric AIDS (100).	X	
	7. Special Projects of Regional and National Significance (SPRANS) grants:[c] fund Hemophilia Diagnostic and Treatment Centers that provide comprehensive care to children and adolescents with chronic illness (252).	X	

Table 9-13—U.S. Department of Health and Human Services HIV/AIDS- and STD-Related Projects and Grants That Include or Target Adolescents, 1989-90[a]—Continued

Agency	Demonstration or research projects/grants that include or target adolescents[b]	Includes adolescents	Targets adolescents
National Institutes of Health (NIH):			
• National Cancer Institute (NCI)	*Research Related to AIDS Treatment:* Expanded eligibility criteria to include HIV-infected adolescents with hemophilia in AIDS treatment protocols (257).		X
• National Center for Research Resources	*Research Related to HIV Prevention:* Biomedical research support grant program: HIV Center for Clinical and Behavior Studies used the funds to conduct pilot interviews with adolescents living on the streets and 10th grade public high school adolescents to increase understanding of their attitudes and knowledge regarding AIDS prevention (159,257).		X
• National Institute of Allergy and Infectious Diseases (NIAID)	*Research Related to AIDS Treatment:*		
	1. AIDS vaccine evaluation units (282).	X	
	2. AIDS clinical trials units.	X	
	3. Cooperative agreements: increase the participation of individuals from racial and ethnic minority groups in clinical trials.	X	
	Research Related to STD Treatment:		
	1. Research for the development of vaccines for gonorrhea, chlamydia, syphilis, and herpes simplex virus type 2.	X	
	2. Research on the natural history and therapy of the human papillomavirus.	X	
• National Institute of Child Health and Human Development (NICHHD)	*Research Related to AIDS Prevention and Treatment:*		
	1. AIDS and its Behavioral Causes: Children's Knowledge and Emotions: research that is developmentally based and studies 6- to 12-year-old children's knowledge, attitudes and feelings related to AIDS, sexuality and substance abuse (also see NIDA and NIMH) (262).	X	
	2. Research on the transmission of HIV from mothers to children (258).	X	
	Research Related to STDs: Research on pelvic inflammatory disease (258).	X	
	Research Related to AIDS and STDs: Research on the relationship between STDs, including AIDS, and fertility related behavior (258).	X	
Office of Population Affairs (OPA)	*AIDS and STD Treatment* Demonstration projects under Title X (Family Planning Services and Population Research Act of 1970 [Public Law 91-572]) of the Public Health Service Act and Title XX (Adolescent Family Life Demonstration Projects) of the Public Health Service Act: direct services related to AIDS and STDs.		X
Office of Minority Health (OMH)	*HIV Prevention:* Minority HIV Education/Prevention Grant Program to 4 national and 23 community-based minority organizations: expand innovative education/prevention activities to racially and ethnically diverse populations (22).	X	

[a] Based primarily on OTA's survey of Federal agencies involved in adolescent health.

[b] Numbers in parentheses are references to citations. Full citations are listed at the end of this chapter.

[c] SPRANS grants are supported through a 10- to 15-percent Federal set-aside from the Maternal and Child Health Services block grant appropriation each fiscal year (249).

SOURCE: Office of Technology Assessment, 1991.

adolescents differ from the issues for adults, they may receive inadequate attention.

As shown in table 9-13, some federally supported AIDS and STD prevention projects do target adolescents. Often, though, young adolescents either do not receive the preventive intervention or receive the same intervention as older adolescents. There is little recognition of adolescents' differing developmental perspectives and needs. The Division of Sexually Transmitted Diseases and HIV Prevention within CDC's Center for Prevention Services, for example, is supporting cooperative agreements for prevention projects for racial and ethnic minority communities; this effort is not adolescent-specific, but the development of activities for adolescents living on the streets is considered a priority (55 FR 9955). In the grant announcement for the projects, however, no mention is made of the differing needs of younger and older adolescents who live on the streets. A 10-year-old is unlikely to require the same types of interventions as an 18-year-old.

The Division of Adolescent and School Health within CDC's Center for Chronic Disease Prevention and Health Promotion focuses *solely* on adolescents unlike the other DHHS agencies. In fiscal year 1990, the Division of Adolescent and School Health awarded over $24 million in cooperative agreements to 20 national, 55 State, and 16 local education agencies to develop effective programs of school health education to prevent the spread of HIV (227). In fiscal year 1989, the Division of Adolescent and School Health awarded 5-year contracts to IOX Assessment Associates, Macro Systems, Inc., and Westat, Inc. to perform evaluation and survey research pertaining to HIV and AIDS (227). The Division of Adolescent and School Health has also provided technical assistance to State and local departments of education to develop and implement an annual school-based survey of 9th to 12th grade students in public and private schools (227,231); during 1989, the survey questionnaire focused on students' HIV-related knowledge, beliefs, and behaviors. Finally, the Division of Adolescent and School Health has worked with State and local departments of education and other Federal agencies to develop a surveillance system—the Youth Risk Behavior Surveillance System—that will periodically measure changes in adolescents' high-risk behaviors, including sexual activity resulting in the transmission of HIV infection and STDs, between 1991 and 2000 (108,227,231).[89] The system will provide comparable data across national, State, and local populations of adolescents.

As this Report was going to press, CDC was hoping to issue requests for proposals to fund coalitions to identify and provide outreach and preventive services to adolescent populations at high risk of HIV infection and other health problems, such as out-of-school youth (272a). Under this program, coalitions would be funded in 3 cities with the highest caseloads of HIV infection (272a). One city would be named a training and demonstration site which would bring together individuals from organizations working with adolescents (e.g., local education agencies, local health agencies, detention centers, runaway shelters). These individuals would then be trained in AIDS/HIV prevention methods and encouraged to build coalitions in their city. (272a).

Three Federal agencies that do support research on young adolescents are the National Institute of Child Health and Human Development within the National Institutes of Health and both the National Institute of Mental Health and the National Institute on Drug Abuse within the Alcohol, Drug Abuse, and Mental Health Administration. These DHHS agencies support research that is developmentally based and studies 6- to 12-year-olds' knowledge, attitudes, and feelings related to AIDS, sexuality, and substance abuse (262).

From responses to OTA's Federal agency survey and the list in table 9-13, it is clear that HIV prevention efforts among adolescents receive much more emphasis at the Federal level than do STD prevention activities (207,208,214,227,251,257,258). Even the one division within CDC that in the past was devoted to STD control is now called the Division of Sexually Transmitted Diseases and HIV Prevention and has as one of its current priority areas the reduction of HIV infection (227). Since 1985, HIV prevention efforts have received a larger share of financial and personnel resources than have STD prevention efforts at both the Federal and State levels (240). In fiscal year 1990, for example, CDC's Division of Sexually Transmitted Diseases and HIV

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[89] The prevalence of other health risk behaviors that will be measured include drug use, alcohol use, tobacco use, dietary patterns, inadequate physical activity, and behaviors resulting in accidental injuries (231).

Prevention, received an estimated $23.7 million for adolescent STD and HIV activities; the Division of Adolescent School Health, where most funds are being used to support the development of effective HIV education for adolescents, received over $36.5 million (108,118,227).

DHHS may be emphasizing the prevention of HIV/AIDS among adolescents for several reasons. First, although STDs other than HIV infection are more prevalent in the adolescent population, HIV infection has potentially greater consequences for affected individuals, their families, and society. There is no cure for AIDS, and AIDS is a fatal and often costly disease; most STDs, on the other hand, are curable. An additional reason for DHHS' emphasis on AIDS prevention rather than STD prevention is that Congress has earmarked funds for AIDS prevention. For example, although the mission of the Division of Adolescent and School Health in CDC is broad in relation to adolescent health, most of the Division's funding has been provided specifically to help schools prevent HIV infection among adolescents (108,227).

It is important to note that the methods that individuals adopt for preventing the sexual transmission of HIV infection and STDs are virtually identical—abstaining from sexual intercourse or modifying sexual or drug-using behaviors that put one at risk of infection. While federally supported STD educational curricula incorporate AIDS information, the importance of STDs other than AIDS tends to be ignored in most HIV educational curricula (117). Federally supported surveys often question adolescent students about their knowledge and attitudes related to AIDS but do not ask similar questions about their knowledge and attitudes related to STDs. An exception was the National Adolescent Student Health Survey; this survey—supported by DHHS through the Office of Disease Prevention and Health Promotion, CDC, and the National Institute on Drug Abuse—did ask adolescents in school questions about their knowledge of both AIDS and STDs (7).

Generally, most of the money from DHHS that supports AIDS and STD prevention projects for adolescents goes to projects that are located in the schools and in major metropolitan areas. This focus is reasonable because most adolescents are in school and metropolitan areas have had the highest reported prevalence rates of AIDS and STDs. On the other hand, prevention activities in schools will not reach out-of-school adolescents who are at increased risk of infection, such as runaway and homeless adolescents, and prevention efforts concentrated in metropolitan areas will not reach adolescents in rural and other areas that are not yet reporting high rates of infection.

As directed by Congress, most funds for HIV prevention efforts by the Division of Adolescent and School Health in CDC are directed to adolescents in schools. CDC guidelines state that HIV prevention efforts should be consistent with community and parental standards (232) so State and local school boards of education have control over the scope and content of HIV and STD preventive messages in the schools. The role of the Division of Adolescent and School Health in determining the content of educational messages about AIDS and STDs to adolescents in school is quite limited. In some communities, teachers are not permitted to discuss condoms as a method of protection against HIV and STDs for fear that such discussion promotes sexual activity. Thus, students in those communities, who do engage in sexual intercourse, may not receive basic information about how to protect themselves against HIV infection or STDs. A recent survey by the National Association of State Boards of Education found that only three States actually had policies indicating that condom use should be discussed as either a recommended or unreliable method of protection (147).

Increasingly, agencies within the Public Health Service are targeting money for prevention efforts to out-of-school adolescents (e.g., dropouts, runaways) who may be at increased risk of infection. As shown in table 9-13, CDC's Division of Sexually Transmitted Diseases and HIV Prevention is supporting the evaluation of strategies for preventing HIV transmission through seven AIDS community demonstration projects. Five of the seven demonstration projects target school-aged adolescents, particularly those who are on the streets (240). In addition, the National Institute of Mental Health (within the Alcohol, Drug Abuse, and Mental Health Administration) and the National Center for Research Resources (within the National Institutes of Health) are supporting AIDS extramural grants to the HIV Center for Clinical and Behavioral Studies for HIV prevention efforts targeting specified groups of adolescents, including runaways and sex offenders (159,203,216,257). Finally, the National Institute on Drug Abuse (within the Alcohol, Drug Abuse, and

Mental Health Administration) provided $715,486 in fiscal year 1989 for an AIDS Community Outreach Demonstration Project in San Antonio, Texas, targeting AIDS education to adolescent runaways (214), and the National Network of Runaway and Youth Services in fiscal year 1989-90 received $156,000 from the Division of Adolescent and School Health in CDC to ensure that its youth-serving agencies throughout the United States operate AIDS prevention and education programs (209,227).

Because of limited funds and higher reported prevalence rates of HIV infection and STDs within major metropolitan areas, most Federal funds are directed to urban areas. CDC's Division of Sexually Transmitted Diseases and HIV Prevention, for example, provides grants and cooperative agreements to 10 STD Prevention/Training Centers, all of which are located in large metropolitan areas such as Newark, Baltimore, Chicago, Dallas, Denver, and Seattle (227) (54 FR 8828; 55 FR 7570). This Division also supports two demonstration projects, one in New York City and one in San Francisco (227). Recently, CDC has provided funding for community-based education in several cities through the U.S. Conference of Mayors, including New York, San Francisco, and Los Angeles, in addition to providing money to the States to distribute to localities (198). The U.S. Conference of Mayors received $857,000 in 1991 and planned to award grants to 17 nonprofit, nongovernmental, community-based organizations (198a). Out-of-school youth and racial and ethnic minorities are two priority groups receiving education from these community-based efforts. Given that overall AIDS cases are becoming increasingly common in rural and noncoastal areas (77), direct funding of efforts in these areas as well may help prevent further transmission of infection into yet uninfected populations.

The most effective way for adolescents to avoid acquiring an HIV infection or STD is to abstain from sexual intercourse. For adolescents who do not abstain from sexual intercourse, however, the proper use of condoms is the most effective method to reduce the chances of infection (222). Few federally supported projects are studying adolescents' attitudes toward condoms in relation to the prevention of HIV and STDs. CDC's Division of Sexually Transmitted Diseases and HIV Prevention is supporting applied research projects that not only will study people's attitudes toward condom use but will evaluate strategies using condoms for controlling syphilis, but those projects are not adolescent-specific (54 FR 8828). In addition, during fiscal year 1987-88, the National Institute of Health's National Institute of Child Health and Human Development made the development of safe, more effective contraceptives that would help to prevent the transmission of HIV infection and STDs one of its priorities. The reason for the lack of Federal support for HIV and STD prevention projects related to adolescents and condoms is unclear, but it may be an unintended result of the Federal Government's nearly exclusive emphasis on getting adolescents to abstain from sexual intercourse. Some of the limitations of relying exclusively on abstinence to control the spread of HIV and STDs among adolescents were noted earlier in this chapter.

DHHS is increasingly directing money for HIV and STD prevention efforts to members of racial and ethnic minority groups at increased risk of HIV and STDs. As directed by Congress in fiscal year 1988, for example, the Office of Minority Health in the Public Health Service awarded approximately $1.4 million to 4 national and 23 community-based minority organizations for HIV prevention and education efforts directed at racial and ethnic minority populations, including adolescents (22). Five of these HIV prevention projects specifically address the needs of racial and ethnic minority adolescents; interventions include a peer teen HIV prevention program for black youth in Los Angeles and family-based HIV prevention strategies for a Hispanic community in Salt Lake City. In addition, CDC's Division of Sexually Transmitted Diseases and HIV Prevention has made street outreach programs to assist adolescents on the street get HIV and AIDS risk-reduction counseling a priority activity in its Cooperative Agreements for Minority Community-Based HIV Prevention Projects (55 FR 9955). These projects may increase understanding as to how to most effectively target interventions to adolescents in racial and ethnic minority groups with high reported prevalence rates of HIV and STDs.

Federal Programs Related to AIDS and STD Treatment

Primarily because relatively few adolescents are diagnosed with AIDS, federally funded AIDS treatment services are rarely specific to adolescents. Most AIDS treatment and treatment-related research efforts include adolescents within populations of adults or children. The primary agencies within DHHS that provide AIDS treatment services or AIDS treatment-related research are the Bureau of Maternal and Child Health in the Health Resources and Services Administration and the National Institute of Allergy and Infectious Diseases in the National Institutes of Health. Both the Health Services and Resources Administration and the National Institutes of Health are components of the Public Health Service.

The Bureau of Maternal and Child Health of the Health Resources and Services Administration funds various AIDS treatment-related activities that include adolescents. As shown in table 9-13, these include subacute care demonstration projects, pediatric AIDS health care services demonstration projects (as described above), pediatric AIDS comprehensive center demonstration projects, and national issues of high priority in pediatric AIDS (100,249).

The Bureau of Maternal and Child Health also administers the maternal and child health block grants to States. As discussed at the beginning of this chapter, however, services funded with these grants are determined by the States receiving the grants. The Federal Government's ability to target block grant funds for AIDS or other services is limited to the 15 percent of the block grants that is set aside to fund "special projects of regional and national significance" (SPRANS). Through SPRANS, the Bureau of Maternal and Child Health supports hemophilia diagnostic and treatment centers, which have been recognized by the DHHS Secretary's Workgroup on Pediatric AIDS as models for comprehensive care for children and adolescents with chronic illness[90] (90,209,252). An interdisciplinary team of professionals provide medical and dental care, physical therapy, orthopedic care, psychosocial care, vocational counseling, and genetic counseling in inpatient and outpatient settings in the context of an adolescent's family (209). With the help of a $6.2 million transfer from CDC, the 25 regional hemophilia centers will focus on the serious AIDS-related problems of hemophiliacs and their families (253).

The National Institute of Allergy and Infectious Diseases within the National Institutes of Health recently made adolescents eligible to participate in adult AIDS clinical trials by dropping the age of eligibility from 18 to 13.[91] Because adolescents are not actively sought to participate in trials, however, many eligible adolescents are not involved (90,91a, 184). To encourage the participation of individuals from racial and ethnic minority groups who are underrepresented in clinical trials, the Institute has set aside $3.6 million for cooperative agreements, but these agreements are not specific to adolescents (283). The National Institute of Allergy and Infectious Diseases also supports research efforts to study potential vaccines and treatments for STDs (e.g., gonorrhea, chlamydia, syphilis, and herpes simplex virus type 2).

Adolescents can receive services for family planning and STD-related services through the 4,000 family planning clinics supported by Federal funds under Title X of the Public Health Service Act (Family Planning Services and Research Program [Public Law 91-572]). These grant programs are administered by the Office of Population Affairs within the Public Health Service of DHHS. Among the current priority areas for Title X monies are STDs, AIDS, the involvement of families, and abstinence (207).[92] Adolescents can receive STD-related services through some demonstration projects funded under Title XX (Adolescent Family Life Program) of the Public Health Service Act (as amended by Public Law 97-35). Title XX of the Social Security Act, as amended by Public Law 97-35, authorizes funds to be provided to States for the provision of social services, including family planning services (207). The Federal Government's emphasis on encouraging abstinence from sexual activity and the requirement that organizations not provide abortion services (207) may have the effect of limiting sites providing STD and AIDS services to adolescents. Adolescents who continue to engage in sexual intercourse despite the Federal Government's emphasis on abstinence, therefore, may be placed at unnecessary risk for HIV infection and STDs because access to appropriate STD and AIDS services may be limited.

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[90] For a discussion of adolescents with chronic illness, see ch. 6, "Chronic Physical Illnesses: Prevention and Services," in this volume.

[91] The institutes of the National Institutes of Health provide services only in conjunction with their research efforts.

[92] For further discussion of Titles X and XX of the Public Health Service Act, see ch. 10, "Pregnancy and Parenting: Prevention and Services," in this volume, and ch. 19, "The Role of Federal Agencies in Adolescent Health," in Vol. III.

Recently, the Federal Government passed the Ryan White Comprehensive AIDS Resources Emergency Act (Public Law 101-381), which authorizes $4.4 billion in Federal funding to metropolitan areas hardest hit by the AIDS epidemic. The Health Resources and Services Administration and CDC within DHHS are the agencies primarily responsible for the implementation various aspects of the act (198b).

Conclusions and Policy Implications

AIDS and other STDs are important adolescent health concerns. Although AIDS can be classified as an STD,[93] it has sometimes been distinguished from other such diseases for reasons related to risk factors, consequences of the diseases, strategies for prevention, research, and implications for the delivery of treatment services.

Perhaps the most compelling difference between AIDS and other diseases that can be transmitted sexually is that AIDS is almost inevitably fatal.[94] This almost certain fatality, paired with the long period between initial infection and the appearance of symptoms of AIDS (now thought to be 8 to 10 years), during which time an infected person can unknowingly transmit the virus to others, makes it a particularly frightening disease. Thus, AIDS has been designated the Nation's number one health priority by DHHS.

Concern about HIV infection and AIDS among *adolescents* seems to have lagged behind. Perhaps one reason for the lag is that the long latency period means that few adolescents (568 cases, or less than 1 percent of AIDS cases in the United States through August 31, 1990)[95] were among those actually diagnosed as having AIDS.

The fact that few adolescents have been diagnosed with AIDS, however, may result in a false sense of security. Small samples of adolescents whose blood has been tested for HIV suggest that the rate of HIV infection may be as high as 3.4 percent for runaway and homeless adolescents seen in New York City. Even more disturbing is the finding that people who are diagnosed with AIDS in their early twenties make up 4 percent of AIDS cases in the country, suggesting that HIV infection may be higher than currently known in adolescents.[96] For these reasons, AIDS among adolescents should be of critical concern to the Nation's health policymakers.

If one uses prevalence and ease of transmission as benchmarks, paired with long-term implications for infertility and other serious chronic health problems, some diseases other than AIDS that can be transmitted sexually should also be a critical concern. Yet another basis for concern about traditional STDs is that the presence of some STDs may facilitate the transmission of HIV. Available data, incomplete though they are, suggest that the rate of STDs among adolescents is high. Rates for chlamydia infection, the most prevalent STD among adolescents, varies from 3 to 37 percent depending upon the population surveyed (see table 9-6). Rates for gonorrhea vary from 3 to 18.5 percent and would probably be higher if the rates were based on the number of sexually active adolescents rather than the entire adolescent population (239,240). Given the asymptomatic nature of many STDs, diverse State laws for reporting, adolescents' lack of knowledge about STD symptoms and about the availability of and confidential treatment, the picture of STDs among the adolescent population may be even worse than it appears.

Efforts to prevent both HIV infection and other STDs are stymied by a lack of information about adolescent behaviors. Unfortunately, little is known about the extent of risky sexual practices among adolescents (including nonuse of condoms and sexual intercourse with older, perhaps infected, individuals) or about adolescents' perceived or actual access to preventive and treatment services.

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[93] Although the virus that causes AIDS (HIV) *can* be, and usually is, transmitted sexually in adolescents, there are other modes of transmission, such as through IV drug use and through the transfusion of contaminated blood and blood products for the treatment of hemophilia, that are not common to many other STDs although they may occur. Thus, prevention strategies for AIDS must entail efforts directed at other means of transmission, such as blood transfusions.

[94] As of May 1990, 61 percent of the 130,252 cumulative AIDS cases reported among adults and adolescents ages 13 and over had died (237).

[95] Cases are through Aug. 31, 1990, and represent adolescents ages 13 to 19 (237a).

[96] The fact that older adolescent and young adult men are likely to engage in sexual intercourse with younger females (see ch. 10, "Pregnancy and Parenting: Prevention and Services") and, apparently, males provides additional cause for concern. Fortunately, female-to-male sexual transmission appears to be more difficult than male-to-female transmission, so that females who in turn have sexual intercourse with adolescent males around their own age are probably not as likely to continue the chain of transmission. Sexual practices involved in male-to-male transmission, however, make AIDS a health problem of extreme concern for sexually active homosexual adolescents.

Given the heterogeneity of the population and the current levels of infection already present in the population, controlling the spread of HIV infection, AIDS, and other STDs within the entire adolescent population has proven difficult. Despite the current ongoing efforts, more remains to be done for adolescents who are already infected and for those who are not.

Prevention of HIV Infection, AIDS, and Other STDs in Adolescents[97]

As noted throughout this chapter, the most effective way for adolescents to avoid acquiring an HIV infection or other STD is to abstain from sexual intercourse and IV drug use.[98] For those adolescents who do not to abstain, however, the only way to prevent infection is to adopt safer practices, such as the use of condoms and the refusal to share IV drug needles. Most education-based AIDS and STD prevention efforts are designed to convince adolescents to change their behaviors so they do not get infected at all; additionally, most efforts are directed at changing adolescent sexual behavior rather than behaviors related to IV drug use. To OTA's knowledge, most prevention efforts focus on HIV and AIDS and do not address other STDs, though an HIV prevention course would clearly provide a good opportunity to discuss STDs.

Conclusions and policy implications related to the design of effective prevention programs for HIV infection and STDs are difficult to draw. For many reasons, including time and fiscal restraints, few careful evaluations of AIDS and STD prevention projects for adolescents have been conducted. Most programs use measures other than infection rates, such as measures of knowledge and attitudes, to determine an intervention's success. The use of measures other than infection rates may be due, in part, to the relatively infrequent occurrence of STDs and especially HIV within a targeted adolescent population. With the evidence that is available, however, several conclusions about STD and HIV prevention can be drawn.

For adolescents, particularly younger adolescents, who have not yet initiated sexual intercourse, evidence from pregnancy prevention programs indicates that interventions begun before the initiation of sexual intercourse have been effective in delaying sexual intercourse.[99] The most effective interventions may be those that combine a variety of approaches, including discussions of responsible sexuality. Pregnancy prevention programs that delay the initiation of sexual intercourse probably indirectly affect the rates of HIV and STDs, although their effect on HIV and STDs has not yet been demonstrated.

Evidence that some adolescents lack accurate information about HIV and STDs suggests that, at a minimum, adolescents—especially older adolescents who are sexually active—need information about condoms and other methods of protecting themselves from infection. When STD and HIV education programs in the schools have been provided, they have proven useful in increasing adolescents' knowledge over short periods of time. Over longer periods of time, however, increases in knowledge seem to disappear. Because education-based prevention efforts in the schools are often of limited duration, it is not surprising that knowledge increases are not maintained especially given the amount of time adolescents spend outside of school in other activities and with other people who may provide inaccurate and often conflicting information.

Education-based AIDS and STD prevention programs in the schools that appear to be particularly promising are those that are implemented before adolescents engage in risky sexual and drug-using behaviors. Thus, educational approaches that address HIV infection and other STDs may be most effective if they are begun in elementary and middle school rather than in high school when such behaviors may have already occurred. Efforts are underway to develop age-appropriate and culturally relevant messages, but to OTA's knowledge, they have not been evaluated for their effectiveness.

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[97] Because AIDS is caused by infection with HIV, efforts often focus on preventing the initial infection of HIV. Therefore, activities in this section are referred to HIV prevention efforts rather than AIDS prevention efforts.

[98] This chapter focused specifically on preventing transmission through sexual intercourse and IV drug use. Other routes of transmission, including the transfusion of contaminated blood and blood products for the treatment of hemophilia, require different prevention efforts, such as blood donor screening, which are not discussed here.

[99] For a discussion of pregnancy prevention programs, see ch. 10, "Pregnancy and Parenting: Prevention and Services," in this volume.

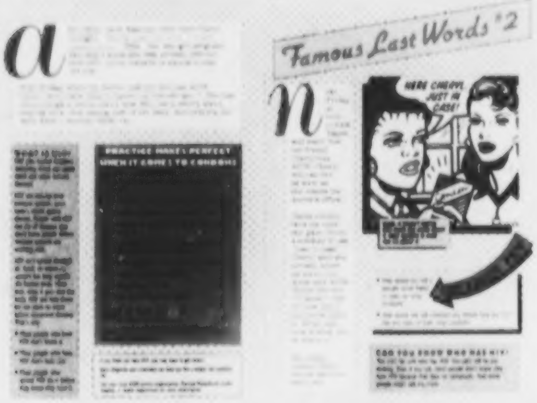
Famous Last Words #2
PRACTICE MAKES PERFECT WHEN IT COMES TO CONDOMS
HERE CHERYL JUST IN CASE!

Photo credit: Planned Parenthood Federation of America®
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Some AIDS booklets, such as this one for sexually active young teenagers, use a comic-book-sized, colorful format. The booklet includes instructions for condom use, scripts to use in negotiating condom use, comparisons of risks related to alternative sexual behaviors, and basic facts about the human immunodeficiency virus (HIV). The booklet was designed for adolescents reading as low as the third-grade level.

Given that most adolescents live at home and that adolescents often view their parents as credible sources of information, AIDS and STD preventive interventions within families may be promising, at least for adolescents with strong familial bonds. Few family-based efforts related to HIV prevention have been evaluated to date, and virtually no activities have been directed to families for the prevention of STDs.

Conclusions related to the effectiveness of education-based prevention efforts in modifying the behaviors of adolescents who have already begun engaging in sexual intercourse and IV drug use are not encouraging. It does appear that some adolescents report adopting preventive behaviors as a result of a fear of AIDS. Despite recent HIV and STD education efforts by schools, however, most adolescents have not consistently adopted safe sex or needle practices.

Few studies have specifically looked at adolescents and their attitudes toward condom use as a method of HIV and STD prevention. There is some evidence to suggest that adolescents who perceive that condoms reduce pleasure or are embarrassing to buy or use are highly unlikely to use them. Although adolescents can obtain free condoms in a few locations, little is known regarding the impact of these programs on adolescents' attitudes, behavior, and incidence of HIV and STDs. Additionally, because most prevention efforts aimed at IV drug users target adults, little remains known about effective prevention programs for adolescents.

Innovative approaches, such as distributing condoms through vending machines and by individuals who deliver them directly to a person's door, are currently taking place on college campuses and universities in the United States for young adults and in high schools in other countries, such as Canada (44,123). More innovative condom distribution programs such as these may be needed in order to control the spread of HIV infection and other STDs among adolescents who choose not to abstain from sexual intercourse. These programs may be most appropriate for older adolescents who are more likely to be sexually active than younger adolescents. It seems reasonable to expect that the more effective programs will be those that address adolescents' perceptions related to the difficulty in using condoms. Limited access to condoms because of inconvenient dispensing locations may be an additional barrier to adolescents who want to practice safer sex.

Given that adolescents' sexual and drug-using behaviors are tied intricately with adolescents' personal values, perceptions of peers' attitudes, feelings about themselves, perception of risk, comfort in discussing and negotiating less risky behaviors, and community norms—behaviors that have evolved throughout adolescence—it may be unrealistic to expect that a small number of classes, a pamphlet, or a public service announcement will dramatically change an adolescent's sexual and drug-using behaviors. Preliminary evidence suggests that the most promising approaches to changing behavior may be those that combine role playing exercises and involve other same-aged adolescents to improve decisionmaking and communication skills that deal with real and perceived peer pressures in negotiating safer sex and drug-use behaviors with unwilling or ambivalent partners.

Many AIDS and STD prevention efforts have been unable to or have not reached runaway, homeless, and incarcerated adolescents, groups which may be at increased risk of infection because of high levels of sexual activity and low consistent use of contraception (262b).[100] It seems reasonable to expect that for these adolescents, the most successful approaches may be those that address other additional concerns, concerns that these adolescents perceive as more important, such as shelter and food.

Treatment of AIDS and STDs in Adolescents

For adolescents who are already infected with HIV or STDs, clearly the best treatment is treatment that is given early (early treatment of HIV with zidovudine has been shown to reduce symptoms and prolong individuals' lives). For many reasons, including the fact that STDs are often asymptomatic, however, adolescents tend to delay treatment. Active and flexible approaches to encourage adolescents with HIV infection or other STDs to seek treatment and return for followup care are needed. For example, despite the fact that States have waived parental consent requirements for treatment of STDs because of serious public health concerns, three-quarters of adolescents are unaware of the availability of free, confidential treatment (7). Clinicians who are responsive to adolescents and their health problems and who are perceived by adolescents to be friendly, understanding, and willing to take their time may be the most effective in getting adolescents to return for care. Additionally, because single dose regimens ensure compliance and confidentiality, clinical experiences suggest that therapies involving single-dose regimens rather than multiple-dose regimens may be more effective in treating adolescent STDs. Treatment for some STDs, including chlamydia infection, however, is only effective using multiple doses, so continued research is needed to develop therapies that may be more effective in treating AIDS and STDs in adolescents.

Relatively few adolescents are enrolled in federally sponsored AIDS clinical trials. Access to these trials appears particularly difficult for those adolescents who do not have regular access to the health care system. Typically, parents find out about clinical trials through physicians, but those adolescents at greatest risk may not be living with their parents. Research protocols may need to be more adolescent-specific to increase adolescents' participation in clinical trials. Often, for example, adolescents are included with adults up to age 99. Many adolescents do not use the traditional health care system; therefore, eligible adolescents may need to be recruited through agencies and other systems, such as the child welfare system. The National Institute of Allergy and Infectious Diseases of the National Institutes of Health in DHHS has set aside $3.6 million for cooperative agreements to encourage the participation of individuals from racial and ethnic minority groups who are underrepresented in clinical trials; these agreements are not specific to adolescents (283).

Data from the Health Resources and Services Administration's hemophilia diagnostic and treatment and Pediatric AIDS Health Care Demonstration Project centers may provide essential information for appropriate comprehensive care for children and adolescents with serious AIDS-related problems and their families.

Federal Agencies' Role in Prevention and Services

Responsibility for controlling the spread of HIV infection, AIDS, and other STDs within the adolescent population rests with Federal, State, and local governments. Within the Federal Government, several agencies of DHHS are playing a major role in attempts to control the spread of HIV infection, AIDS, and STDs. Whether their activities are sufficient, and specific enough, in relation to adolescents, however, is open to question. The requirements for reporting HIV, AIDS, and STDs, for example, are determined at the State and local level. In order to more clearly define the extent of the HIV, AIDS, and STD problem within the adolescent population and more appropriately target preventive interventions, the Federal Government may want to support more thorough research related to epidemiology and the differences in the occurrence of disease between younger and older adolescents; homosexual, bisexual, and heterosexual adolescents; in-school and out-of-school youth; and among various socioeconomic groups. Additionally, although reporting requirements are determined at the State level, the Federal Government may want to more strongly encourage States to collect and report additional demographic data, such as smaller age breaks, socioeconomic status, and race, to CDC.

Typically, the Federal Government provides technical and limited monetary support for prevention and research activities to States, localities, and organizations serving adolescents. Given the heterogeneity of the adolescent population, prevention strategies need to address the sexual and drug-using behaviors within the entire adolescent population and in certain subgroups, such as homosexual and bisexual adolescents, racial and ethnic minority groups, homeless adolescents, and incarcerated adolescents in order to control the transmission of HIV and STDs within the adolescent population. While most of the content and message of prevention efforts is determined at the State level, CDC's guidelines for effective school health education to prevent HIV do not address the actual sexual and drug-using practices of adolescents and have been slow to include prevention education address efforts for out-of-school adolescents. In addition, the Federal Government's general emphasis on abstinence and restrictions on support for programs that may be perceived as encouraging homosexuality may have the effect of limiting the more effective activities for controlling the spread of HIV, AIDS, and STDs among adolescents who are most at risk of infection, namely those adolescents who choose to remain sexually active. It is encouraging, however, that the CDC has recently stated that sexually active adolescents should be encouraged to use condoms.

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[100] See ch. 14, "Homelessness: Prevention and Services," in this volume.

Most federally supported educational prevention activities for adolescents are limited to students and adolescents living in metropolitan areas. Few address adolescents' differing developmental needs, and most include younger and older adolescents together. More specifically, adolescents who are homosexual and bisexual, adolescents who are not in school (such as runaway and homeless youth), and adolescents who live in rural areas receive relatively little Federal financial support. Although the number of Federal AIDS prevention activities reaching racial and ethnic minorities of all ages has increased recently, only a few projects specifically target adolescents from minority groups. Finally, there are few federally supported prevention efforts targeting adolescent IV drug users.

To increase funding to these adolescent groups who receive little Federal support, the Federal Government may want to consider providing set-asides in the social services and maternal and child health services block grants to the States. There is precedent for this type of funding. For example, because Members of Congress became concerned about child sexual abuse, Congress appropriated a $25 million increase in the Title XX Social Services Block Grant program funding in fiscal year 1985 for use by the States in providing training and other related activities to child day care staff (200). Additionally, in order to reach adolescents in low prevalence areas, the Federal Government needs to do more than fund cities with high prevalence of HIV, AIDS, and STDs.

Because DHHS has made AIDS the Nation's number one health priority, the importance of STDs other than AIDS as a public health problem and the money allocated to control them has been directly affected. In fact, HIV efforts have received a larger share of financial and personnel resources than have STD prevention efforts since 1985 at both the Federal and State levels (240). Given that more adolescents have other STDs than have AIDS, that adolescents may perceive themselves at greater risk for STDs than for HIV infection, and that the presence of STDs may facilitate the transmission of HIV, the Federal Government as well as State governments may want to ensure the integration of STDs into HIV educational efforts. Federal and State governments could require that STD education be incorporated within HIV education as a condition for funding at the local school level. Additionally, Federal funding for HIV-related activities targeting out-of-school adolescents and racial and ethnic minorities could also be made contingent upon the incorporation of STD with HIV/AIDS information.

DHHS also provides financial assistance for the treatment of AIDS and STDs. While the Federal Government has developed guidelines for treating certain STDs, however, many of the guidelines are not specific to adolescents, and neither are the guidelines for treating adolescents with AIDS.

Because adolescents receive many, often conflicting, messages from the media, peers, adults, and the Federal Government, interventions need to provide unambiguous yet developmentally and culturally appropriate messages to adolescents who are not yet engaging in sexual intercourse or drug use and those who are. Unless more creative approaches are found to control HIV, AIDS, and STDs among adolescents who are not yet infected and those who are already infected, adolescents will continue to contract HIV infection and STDs. Prevention of infection is the most effective approach to control, but careful evaluations are needed and much more remains to be done to make adolescents as well as society aware of the risk of HIV infection, AIDS, and STDs to adolescents.

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Chapter 10

PREGNANCY AND PARENTING: PREVENTION AND SERVICES

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Chapter 10

PREGNANCY AND PARENTING: PREVENTION AND SERVICES

Introduction[1]

In 1988, roughly one million U.S. adolescents became pregnant, and nearly half a million gave birth. In recent decades, sexual activity rates among U.S. adolescents have been increasing, but birth rates among U.S. adolescents have generally been declining.[2] Since 1960, however, births to *unmarried* U.S. adolescents have increased dramatically (195c). About two-thirds of the almost 488,941 U.S. females under age 20 who gave birth in this country in 1988 (as compared to about one-fifth in 1960) were single mothers (195c). Some of the immediate difficulties encountered by unmarried adolescents who become pregnant and bear children out of wedlock are illustrated by one mother's story in box 10-A.

Early out-of-wedlock childbearing increases dramatically the chance that a mother and her child (or children) will live in poverty. Because of their need for economic and other support, adolescents who become mothers and their children cost U.S. taxpayers a substantial amount of money. Families started by adolescents account for the majority of families receiving benefits under Aid to Families With Dependent Children (AFDC) program; and in 1985, AFDC, Medicaid, and Food Stamp Program costs for families begun by a birth to a teenager were estimated to be $16.65 billion (149).[3] In 1988, Federal, State, and local governments spent an estimated $20 billion on AFDC, Medicaid, and food stamps to support families started by women when they were under age 20 (33).[4] These estimates do not include other public costs commonly associated with family support such as housing subsidies, foster care, or day care (33).

Adolescent pregnancy and parenthood are not new phenomena in this country. In recent decades, however, numerous societal and other transformations have changed the context in which these phenomena occur and heightened perceptions that pregnancy and childbearing among U.S. adolescents are serious problems (13,148,149,235). Among the concerns are recent increases in births to adolescents as a proportion of all births and the rising number of these that are out of wedlock (51a,89a). Black adolescents have much higher rates of premarital pregnancy and out-of-wedlock births than white adolescents, but in recent decades, a large increase in out-of-wedlock childbearing rates has taken place among whites (51a,196).

This chapter examines the problems of adolescent pregnancy and parenting. The first section of the chapter presents background information on sexual activity, pregnancies, births, and abortions among U.S. adolescents. Subsequent sections review programs that may help prevent adolescent pregnancy, programs that may help prevent negative outcomes associated with adolescent pregnancy and parenting, and major Federal policies and programs pertaining to adolescent pregnancy and parenting. The chapter ends with conclusions and policy implications.

Background on Adolescent Pregnancy and Parenting

Sources and Limitations of Data on Adolescent Sexual Activity, Pregnancy, Childbearing, and Abortion

Data on U.S. adolescents' sexual activity, contraceptive use, pregnancy, childbearing, and abortion are available from a variety of sources described below. Data on births among adolescents, as noted below, are considerably more accurate than data on sexual activity, pregnancies, or abortions.

Data on U.S. adolescents' *sexual activity* have been collected in several surveys, although the type

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[1] Although the focus of OTA's adolescent health report is on adolescents ages 10 through 18, much of the data on adolescent pregnancy presented in this chapter is for adolescents ages 15 to 19. Those are the ages covered in most published data on adolescent pregnancy.

[2] Birth rates among black U.S. adolescents declined in the 1970s, but increased during the 1980s (202f). Also an upswing in birth rates occurred among 15- to 17-year-olds and 18- to 19-year-olds in 1988 and bears watching (202f).

[3] These and other Federal programs relevant to low-income adolescents are discussed in ch. 18, "Issues in the Delivery of Services to Selected Groups of Adolescents," and in ch. 19, "The Role of Federal Agencies in Adolescent Health," in Vol. III.

[4] According to the Center for Population Options, the components of these estimates were as follows: $10.07 billion for AFDC, $6.53 billion for Medicaid, and $3.23 billion for food stamps (33).

Box 10-A—The True Story of Keesha: An Unwed Teenage Mother[1]

At the age of 11, Keesha moved in with her grandmother because of problems with her mother at home; after only a year with her grandmother, she moved in with an aunt. Life was hard with her aunt, who beat Keesha, and told Keesha that she was never wanted by her mother. Finally, after telling her mother about beatings by her aunt, Keesha was sent to live with another aunt, and later back to her grandmother's.

When Keesha was 16, her mother became very ill. After being turned away from one hospital because she had forgotten her insurance card, Keesha's mother was admitted to another hospital, where doctors discovered a cancerous tumor on her kidney. At that time, she had surgery to remove the tumor and one of her kidneys. After staying in the hospital for a couple of months, she was discharged on Christmas Eve so she could spend the holidays with her family. Because she was so ill, however, and was having trouble with falling down, she was readmitted to the hospital in a few days. Her condition continued to decline, and shortly after the New Year, she died.

In elementary school, Keesha was a popular and successful student, but after moving so many times, she began to have problems in school. Finally, when her mother became ill, Keesha dropped out of school to stay home with her mother.

Keesha had sexual intercourse for the first time at the age of 15, and shortly before her mother died, Keesha became pregnant. When Keesha was 3 months pregnant, her grandmother, with whom she had been living, had a fatal heart attack. Keesha then began moving around from place to place, first with a friend, then with a friend of her mother. Keesha had a difficult pregnancy, and at 7 months, she was hospitalized until the birth of her daughter.

After the birth, Keesha went to stay with a friend who helped her and the baby out by getting them some clothes from a charitable agency. After a few months, Keesha and her daughter moved to another friend's house. Nothing

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[1] This story is based on a autobiographical note; the name has been changed to protect confidentiality.

and level of information are often insufficient for program and policy purposes (100a).[5] In 1971, the first epidemiological study of U.S. adolescents' sexual activity was conducted by researchers Zelnick and Kantner at Johns Hopkins University, and these researchers conducted subsequent studies in 1976 and 1979 (47a). A more recent survey that collected data on U.S. adolescents' sexual behavior and pregnancies is the National Longitudinal Survey of Labor Market Experience—Youth Cohort (NLSY) (47a). Sponsored by the U.S. Department of Labor, NLSY was begun in 1979 with a youth cohort of over 12,000 males and females ages 14 to 21. One positive feature of this survey was oversampling of black and Hispanic youth and of white youth from socioeconomically disadvantaged families to provide sample sizes large enough for statistically reliable ethnic and socioeconomic comparisons.

Data on U.S. adolescent females' sexual activity (and other items, including contraception, spontaneous fetal losses, and prenatal care) are available from the National Survey of Family Growth conducted periodically by the National Center for Health Statistics in the U.S. Department of Health and Human Services (DHHS) (47a,213). This survey has been tracking fertility patterns and contraceptive use of American women ages 15 through 44 since the early 1970s. Cycle III of the survey was conducted from August 1982 through February 1983 and interviewed a sample of about 8,000 U.S. females of childbearing age (ages 15 through 44). Cycle III included unmarried adolescents for the first time and sampled black women and adolescents ages 15 to 19 at higher rates than other women (202e). Data on younger adolescents are not available from this survey. Cycle IV of the National Survey of Family Growth was conducted in 1988 among about 8,500 U.S. females ages 15 to 44 (59a).

Among the other sources of data on U.S. adolescents' sexual activity are the High School and

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[5] It is important to note that the term *"sexually active"* is often used in the literature to denote whether an individual has *ever* had heterosexual intercourse. It does not necessarily mean that an individual is currently having sexual intercourse, or indicate the number of partners or number of times. As a rule, those individuals, including adolescents, who have ever had sexual intercourse do report having had intercourse in the past 3 months, which is one measure of current sexual activity levels (59a). In the 1988 National Survey of Family Growth, 92.3 percent of the 15- to 19-year-olds who reported having ever having had intercourse also reported having had intercourse in the 3 months prior to the survey date (59a). The term *"sexually experienced"* is also used as a synonym for ever having had sexual intercourse.

ever really seemed to work out, and Keesha and her daughter kept moving from place to place, staying for a little while with someone and then moving on. Some of the neighborhoods they lived in were pretty dangerous. In some places they stayed, there was a lot of drug traffic, and violence and shootings were common.

Keesha tried to find some kind of social services program that could help her and the baby, but she was refused from all of them for a variety of reasons: some were full, some wouldn't take children, and some required that she become a ward of the county, which Keesha didn't want to do because she feared it would result in her losing custody of her baby. She found that regular emergency shelters for the homeless would not take in families with parents under age 18. There were few places designed to serve adolescent mothers and their infant children.

When she was 18, Keesha became pregnant again. She considered having an abortion, but the people she was staying with told her that if she terminated the pregnancy, she would no longer be able to stay with them. Late in her pregnancy, Keesha moved in with another aunt. While living with her aunt, Keesha met a man whom she liked, and she and the baby moved in with him; they continued to stay with him after her second daughter was born. Keesha and her boyfriend had some problems, and Keesha left him several times. One of the things they argued about was whether she would get pregnant again. Keesha said she didn't want to have any more children now, but her boyfriend argued that she should have his baby, since she already had babies fathered by two other men.

Keesha left this man and moved into a one-bedroom basement apartment with another mother of two young children; this housing lasted only a month, and after that, Keesha and her children continued to move from place to place. Then Keesha's children were taken away by the State social services department. She had left both children with the father of the older child (now $2^1/2$) when he was arrested on a Federal warrant. She had been testifying in court on behalf of the father of the younger child (now about 1)—this man had been accused of murder. Keesha moved back with her aunt and worked for a while in a fast food outlet, but when last heard from she was living in a shelter for women. She can't get her children back until she obtains permanent housing and completes a parenting education course. When last seen, Keesha was pregnant again. While pregnant, she was sexually assaulted.

Beyond Survey conducted from 1980 to 1984 and the National Survey of Adolescent Males conducted in 1988. The High School and Beyond Survey followed about 13,000 individuals who were sophomores in 1980 (47a). The National Survey of Adolescent Males, fielded by the Institute for Survey Research at Temple University, interviewed 1,880 U.S. never-married males ages 15 to 19 between April and November 1988 about their patterns of sexual activity (187).

There is no independent and valid measure of *pregnancies* or pregnancy rates, and these are typically calculated using live birth and other data (e.g., by summing the numbers of live births, induced abortions, and fetal losses (214)). Estimates of the number of pregnancies and pregnancy rates among U.S. adolescents are available from the Alan Guttmacher Institute, a private organization. Estimates of pregnancies and pregnancy rates for the United States from 1976 through 1985 are also available from the National Center for Health Statistics in DHHS (214).

Data on *live births* are among the vital statistics available from the National Center for Health Statistics in DHHS (81a,202e). The National Center for Health Statistics obtains information on births from the birth registration offices of all States, New York City, the District of Columbia, Puerto Rico, the U.S. Virgin Islands and Guam (202e). Each year, the National Center for Health Statistics publishes the number of births according to age, race, marital status, and State of residence of the mother. Because data on births among U.S. adolescents are based on a 100-percent sample of birth certificates (which are filed for more than 99 percent of all births), data on births are considerably more accurate than data on sexual activity, pregnancies, or abortions (8). The major Federal report on health indicators in the United States—*Health United States*—tabulates birth rates by race but not by income or other factors indicative of socioeconomic level (202e,202f).

Data on aggregate numbers and rates of induced *abortions* are available from the Alan Guttmacher Institute. The Alan Guttmacher Institute obtains information on the number of abortions in each State from periodic surveys of abortion providers (8,81a,81b,202c). A limitation of the Alan Guttmacher Institute data on abortion is that they do not provide information regarding the age, race, and marital status of the women obtaining abortions (148). Data on abortions performed by or under the supervision of a licensed physician are also available from the abortion surveillance system of the Centers for Disease Control within DHHS (202e). This system currently obtains data on the number of abortions and characteristics of abortion recipients reported by central health agencies in reporting areas that include the 50 States, New York City, and the District of Columbia (202c). the States. The total number of abortions reported to the Centers for Disease Control's abortion surveillance system is considerably smaller than the number estimated independently by the Alan Guttmacher Institute and is probably less accurate (202c,202e). By integrating the Centers for Disease Control data on abortion with the Alan Guttmacher data, one can estimate the incidence and rates of abortions among age, race, and marital subgroups (148). In surveys such as the National Survey of Family Growth, abortions are severely underreported (59a).

The reporting estimates of *spontaneous fetal losses* (miscarriages and stillbirths) among U.S. females is not very accurate (148). Estimates of fetal losses among U.S. females ages 15 to 19 can be tabulated on the basis of 1982 data from Cycle III of the National Survey of Family Growth (214), but these estimates are likely to be undercounts, because early miscarriages are not always detected by the women in whom they occur.

The national *adoption* reporting system was discontinued in 1975, so there are no systematically collected national data on the number of adoptions or trends in adoption (148). Currently, the only system that collects annual information on adoptions is the Voluntary Cooperative Information System, operated by the American Public Welfare System. This system collects data on the characteristics of adopted children and adoptive families placed for adoption by public child welfare agencies. It does not collect data on private placements.

Trends in the Incidence and Prevalence of Adolescent Sexual Activity, Pregnancy, Childbearing, and Abortion

Sexual Activity and Contraceptive Use Among Adolescents

Available data suggest that U.S. adolescents are becoming sexually active at increasingly earlier ages. According to the National Survey of Family Growth, the proportion of 15- to 19-year-old U.S. females who reported having had premarital sexual intercourse has increased steadily since 1970 (202d). The percentage of 15- to 19-year-old U.S. females who reported having had premarital sexual intercourse was 28.6 percent in 1970, 36.4 percent in 1975, 42 percent in 1980, 44.1 percent in 1985, and 51.5 percent in 1988 (202d). The largest relative increase in the percentage of 15- to 19-year-old females who reported having had premarital sexual intercourse occurred among females age 15 (from 4.6 percent in 1970 to 25.6 percent in 1988). Comparable time-series data on adolescent males are not available, but the 1988 National Survey of Adolescent Males found that 64 percent of 15- to 18-year-old males had had sexual intercourse, 33 percent of them by the time they reached 15 (186b,187). There are no national level data on adolescents under age 15.

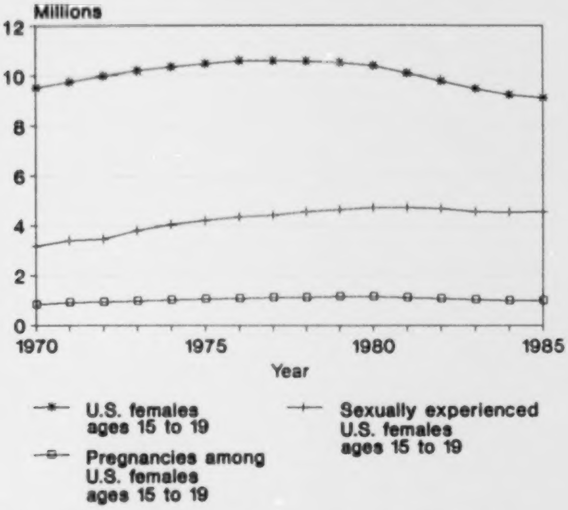
Cycle IV of the 1988 National Survey of Family Growth, which was conducted in 1988, found that among U.S. females at risk of pregnancy, females ages 15 to 19 were more likely than females age 20 and over to be using no contraceptive method (59a). The 1988 survey found that 78.8 percent of sexually active adolescent U.S. females ages 15 to 19 reported "current" use of some method of contraception, as compared to 90.1 percent of all women ages 15 to 44 (143). Still, the percentage of sexually active 15- to 19-year-olds who reported using contraception in 1988 (78.8 percent) was higher than in 1982 (71 percent) (59a). The 1988 National Survey of Adolescent Males had similar findings, with 76.6 percent of 15- to 19-year-old males reporting some form of contraceptive use at last intercourse (186b). Neither survey collected data on contraceptive use among younger adolescents.

Pregnancies Among Adolescents

Each year since 1974 in this country, there are estimated to have been over 1 million pregnancies to mothers between the ages of 10 and 19. It has been projected that as many as 43 percent of the 17 million female adolescents in this country may become pregnant at least once before they reach the age of 20 (58).

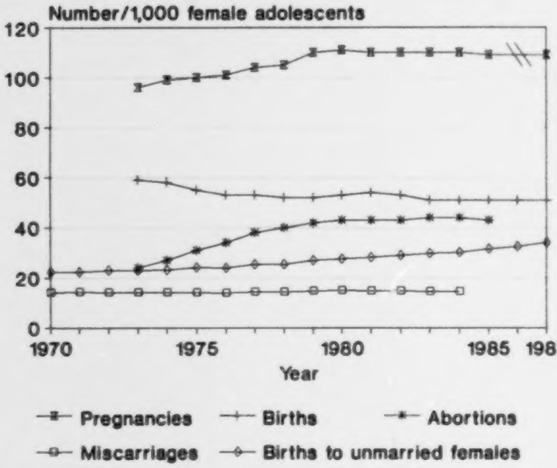
The vast majority of pregnancies among U.S. adolescents occur among females ages 15 to 19. In 1985, for example, an estimated 1,031,000 U.S. females under age 20 became pregnant, and all but 31,000 of them were ages 15 to 19 (81a). Figure 10-1 shows the number of U.S. females ages 15 to 19, the estimated number of sexually experienced U.S. females ages 15 to 19, and the estimated number of

Figure 10-1—Number of U.S. Females Ages 15 to 19, Number of Sexually Experienced U.S. Females Ages 15 to 19, and Estimated Number of Pregnancies Among U.S. Females Ages 15 to 19, 1970-85



SOURCE: Office of Technology Assessment, 1991, based on National Academy of Sciences, National Research Council, Commission on Behavioral and Social Sciences and Education, Committee on Child Development Research, Panel on Adolescent Pregnancy and Childbearing, *Risking the Future, Adolescent Sexuality, Pregnancy, and Childbearing, Volume II: Working Papers and Statistical Appendixes*, S.L. Hofferth and C.D. Hayes (eds.) (Washington, DC: National Academy Press, 1987); and S.K. Henshaw, Alan Guttmacher Institute, New York, NY, personal communication, May 23, 1990.

Figure 10-2—Trends in Pregnancy Rates, Birth Rates, Abortion Rates, Miscarriage Rates,[a] and Out-of-Wedlock Birth Rates Among U.S. Females Ages 15 to 19, 1970-87



[a] Miscarriage rates are derived from the number of miscarriages calculated by Alan Guttmacher Institute as 20 percent of births plus 10 percent of abortions.

SOURCE: Office of Technology Assessment, 1991, based on K.A. Moore and T.M. Stief, "Changes in Marriage and Fertility Behavior: Behavior Versus Attitudes of Young Adults," paper prepared for Child Trends, Inc., Washington, DC, July 1989; National Academy of Science, National Research Council, Commission on Behavioral and Social Sciences and Education, Committee on Child Development Research and Public Policy, Panel on Adolescent Pregnancy and Childbearing, *Risking the Future: Adolescent Sexuality, Pregnancy, and Childbearing, Volume II: Working Papers and Statistical Appendixes*, S.L. Hofferth and C.D. Hayes (eds.) (Washington, DC: National Academy Press, 1987). S.K. Henshaw, Alan Guttmacher Institute, New York, NY, personal communication, May 21, 1990.

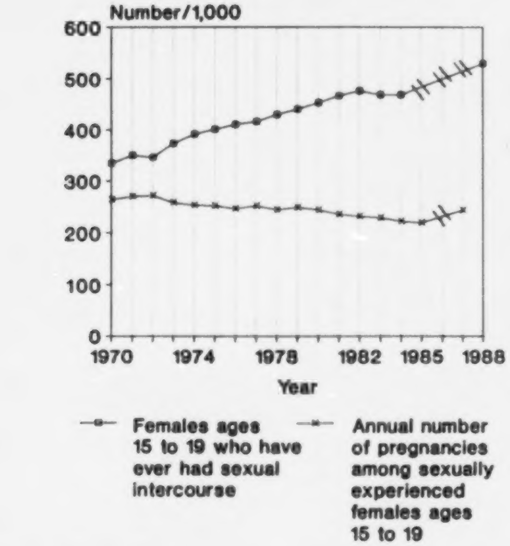
pregnancies to U.S. females ages 15 to 19 from 1970 to 1985.

Pregnancy rates are typically presented as numbers of pregnancies per 1,000 women of a given age or ages in the population. In 1988, the estimated pregnancy rate among all U.S. females ages 15 to 19 was 109 pregnancies per 1,000 females (124a). As shown in figure 10-2, this rate was fairly stable throughout the 1980s (195a). Not unexpectedly, pregnancy rates are higher among older U.S. adolescent females (those ages 15 to 19) than among younger adolescent females (those under age 15). In 1985, for example, the pregnancy rate was 109.8 pregnancies per 1,000 population among U.S. females ages 15 to 19 and 16.6 pregnancies per 1,000 population among U.S. females under age 15 (81a).

As noted above, National Survey of Family Growth data indicate that about half of 15- to 19-year-old U.S. females in 1988 were not sexually active and were therefore not at risk of pregnancy (202d). Trends in sexual experience rates among U.S. females ages 15 to 19 are shown in figure 10-3. Between 1970 and 1985, sexual experience rates in this group rose steadily, but estimated pregnancy rates among *sexually experienced* 15- to 19-year-old U.S. females declined (see figure 10-3). The decline in pregnancy rates among sexually active 15- to 19-year-old females up to 1985 may reflect an increase in older sexually active U.S. adolescents' willingness or ability to use effective contraceptives (25,125,148,187). Estimated pregnancy rates among sexually experienced adolescent females increased between 1985 and 1987, however, and this is a development that bears watching.

Adolescent pregnancy rates are considerably higher in the United States than in many other developed

Figure 10-3—Trends in Sexual Experience Rates Among U.S. Females Ages 15 to 19 and Pregnancy Rates Among Sexually Experienced U.S. Females Ages 15 to 19, 1970-88



SOURCE: Office of Technology Assessment, 1991, based on National Academy of Sciences, National Research Council, Commission on Behavioral and Social Sciences and Education, Committee on Child Development Research and Public Policy, Panel on Adolescent Pregnancy and Childbearing, *Risking the Future: Adolescent Sexuality, Pregnancy, and Childbearing, Volume II: Working Papers and Statistical Appendixes*, S.L. Hofferth and C.D. Hayes (eds.) (Washington, DC: National Academy Press, 1987); J.D. Forrest and S. Singh, "The Sexual and Reproductive Behavior of American Women, 1982-1988," *Family Planning Perspectives* 22(5):206-214, 1990; and S.K. Henshaw, Alan Guttmacher Institute, New York, NY, personal communication, May 21, 1990.

nations (see figure 10-4), despite similar rates of adolescent sexual activity in these countries (148). The higher adolescent pregnancy rates in the United States have been attributed to various factors, among them attitudes regarding sexuality, the nature of media programming, and lack of access to contraceptives (182).

Births Among Adolescents

Of the roughly 1 million U.S. females under age 20 who become pregnant each year, about half give birth. In 1988, there were 488,941 births to U.S. females under age 20 (207b). Of these, 478,353 births were to females ages 15 to 19, and 10,588 births were to adolescents under age 15 (207b). According to a 1987 report by the Panel on Adolescent Pregnancy and Childbearing of the National Academy of Sciences, U.S. adolescents under age 15 are more than five times as likely to give birth as girls in any other Western developed country of the world (148,149).

In 1988, the *birth rate* for U.S. females ages 15 to 19 was 53.6 births per 1,000 females (207b). Not surprisingly, 10- to 14-year-old females have much lower birth rates (1.3 births per 1,000 females) than 15- to 17-year-olds (33.8 births per 1,000) or 18- to 19-year-olds (81.7 births per 1,000) (see figure 10-5). Birth rates among all U.S. females under age 20 began declining in the 1960s and leveled off after about 1976.

The largest decline in birth rates since the early 1970s has occurred among U.S. females ages 18 and 19 (203). Their birth rates dropped from 114.7 births per 1,000 females in 1970 to 81.7 births per 1,000 in 1981 and have remained roughly at that level ever since (figure 10-5) (202f). Birth rates among females ages 15 to 17 and ages 10 to 14 have shown somewhat different trends. Birth rates among U.S. females ages 10 to 14 have remained relatively stable since 1970, at about 1.2 births per 1,000 females (202f,203). Birth rates among U.S. females ages 15 to 17 showed a steady decline from 1955 to 1980, going from 44.5 births per 1,000 females in 1955, to 43.9 births per 1,000 in 1960, to 33.8 births per 1,000 in 1970, to 32.5 births per 1,000 in 1980 (202f). From 1980 to 1986, the birth rate among 15-to 17-year-olds females declined only slightly, dropping to 30.6 births per 1,000 15- to 17-year-old females in 1986 (202f). In 1987, and 1988, the birth rate among 15- to 17-year-olds rose slightly to 33.8 births per 1,000 females, the same level as in 1970 (202f).

As discussed later in this chapter, birth rates for black and white adolescents have differed substantially for many years.[6] Historically, black adolescents have had much higher birth rates than U.S. adolescents as a whole, and white adolescents have had lower birth rates than U.S. adolescents as a whole. Racial disparities in birth rates among U.S. adolescents have narrowed over the years but still

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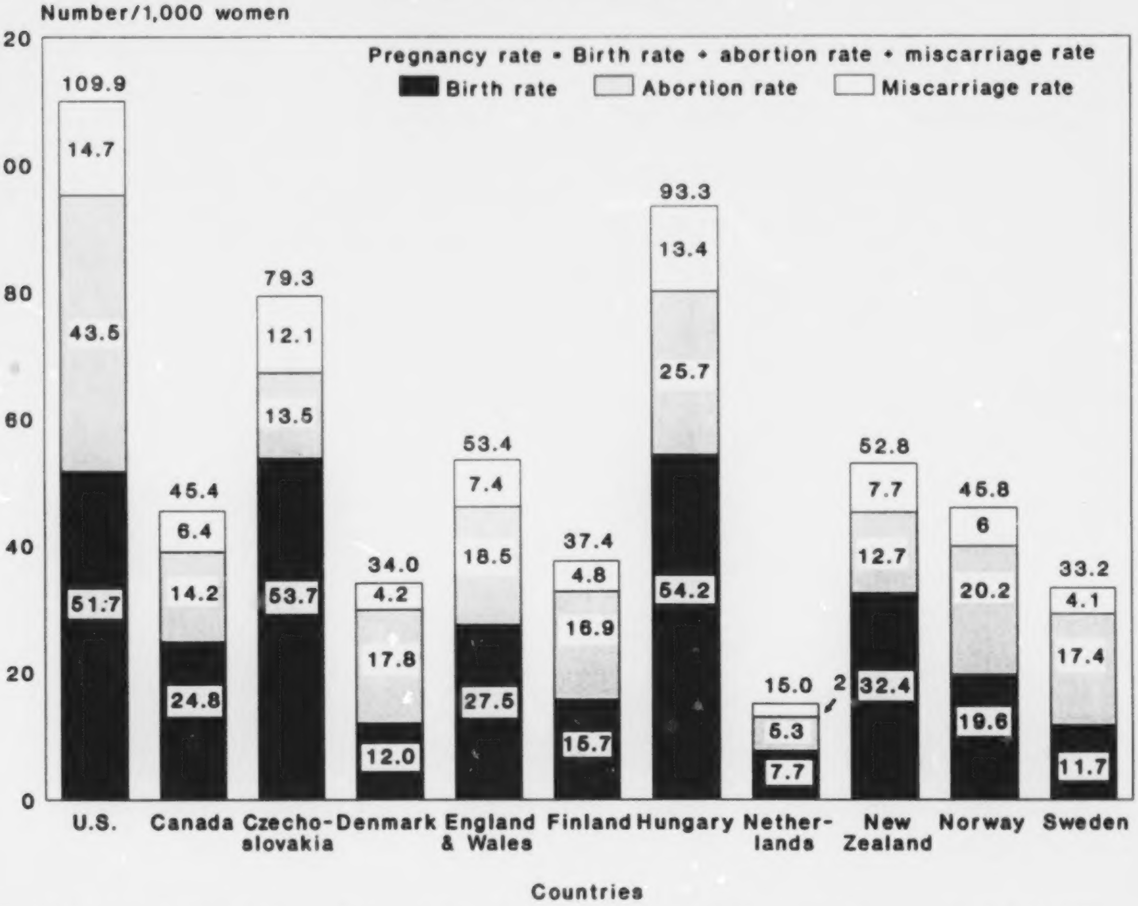
[6] To some extent, racial disparities in birth rates may reflect factors related to socioeconomic status. As discussed later in this chapter, black adolescents are far more likely to be poor or near poor than white adolescents. National data on birth rates among adolescents tabulated by socioeconomic status are not available.

Figure 10-4—Birth Rates, Abortion Rates, Miscarriage Rates, and Pregnancy Rates Among Females Ages 15 to 19 in 11 Countries, 1983



SOURCE: Alan Guttmacher Institute, *Teenage Pregnancy in the United States: The Scope of the Problem and State Responses* (New York, NY: 1989).

remain striking. Thus, in 1988, the birth rates among U.S. females under age 20 were as follows:

- *10- to 14-year-olds*: all races, 1.3 births per 1,000 females, with whites at 0.6 births per 1,000 and blacks at 4.8 births per 1,000;
- *15- to 17-year-olds*: all races, 33.8 births per 1,000 females, with whites at 25.5 births per 1,000 and blacks at 76.6 births per 1,000;
- *18- to 19-year-olds:* all races, 81.7 births per 1,000 females, with whites at 69.2 births per 1,000 and blacks at 150.5 births per 1,000 (202f).

Another point that should be made here is that birth rates among black U.S. females under age 20 have increased rather steadily since 1984, reversing a trend of declining birth rates among black adolescents that occurred in the 1970s and early 1980s (202f). Birth rates among black adolescents in 1988 were at their highest levels in about a decade (202f).

Abortions Among Adolescents

The difference between adolescent pregnancy and birth rates is due primarily to the use of induced abortion.[7] Although over half of all adolescent

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[7] It is also due to spontaneous fetal losses (miscarriages). The number of miscarriages has been estimated by the Alan Guttmacher Institute to be 20 percent of the number of births plus 10 percent of the number of abortions, following a model developed by Bongaarts and Tietze of the Population Council (8).

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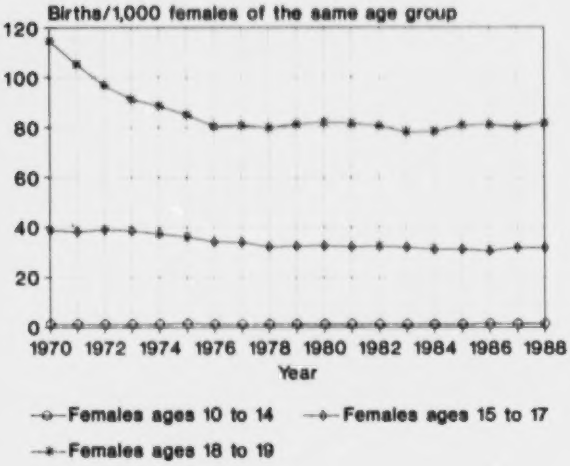
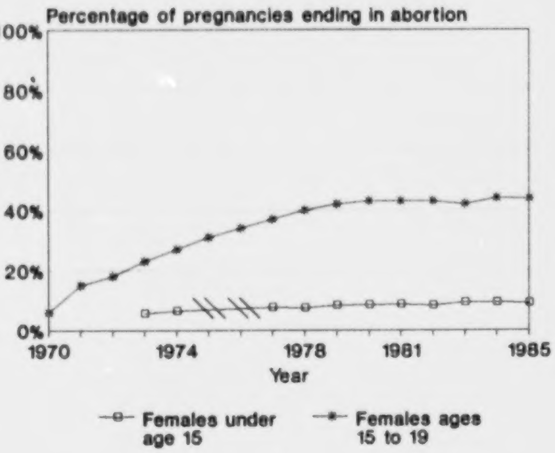
Figure 10-5—Trends in Birth Rates Among U.S. Females Ages 10 to 19, 1970-88



SOURCE: Office of Technology Assessment, 1991, based the following sources: 1970-1987 data: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Center for Health Statistics, Division of Vital Statistics, *Vital Statistics of the United States, Volume 1: Natality* (Washington DC: U.S. Government Printing Office, various years). 1988 data: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Center for Health Statistics, Division of Vital Statistics, "Advance Report of Final Natality Statistics, 1988," *Monthly Vital Statistics Report* 39 (no. 4, suppl.), DHHS Pub. No. (PHS) No. (PHS) 90-1120, Aug. 15, 1990.

Figure 10-6—Trends in the Percentage of Pregnancies Ending in Abortion Among U.S. Females Under Age 20, 1970-85[a]



[a]Data on abortion rates for adolescents under age 15 are not available before 1973.

SOURCE: Office of Technology Assessment, 1991, based on Alan Guttmacher Institute, *Teenage Pregnancy in the United States: The Scope of the Problem and State Responses* (New York, NY: 1989).

pregnancies in this country are carried to term, the use of abortion among U.S. adolescents, as among adults, has increased substantially since the U.S. Supreme Court ruling in the case of *Roe* v. *Wade* in 1973 (7,148).[8]

According to the Alan Guttmacher Institute, there were an estimated 416,170 abortions among U.S. females under age 20 in 1985 (8). Of these, 399,200 were to females ages 15 to 19, and 16,970 were to females under age 15 (8). Twenty-six percent of all abortions in 1985 were obtained by teenagers. In 1984, only 6 percent of the teenagers who obtained abortions were married (8).

Data from the Alan Guttmacher Institute on the percentage of pregnancies ending in abortions among U.S. females under age 20 from 1970 through 1985 are shown in figure 10-6. Between 1970 and 1979, there was a dramatic increase in the percentage of pregnancies ending in abortion among U.S. adolescents ages 15 to 19; the percentage of pregnancies ending in abortions leveled off somewhat between 1979 and 1985 (8). The increase in the percentage of pregnancies ending in abortions among U.S. females under age 15 between 1970 and 1985 was far less dramatic.

According to data from the Alan Guttmacher Institute, the estimated *abortion rate* for U.S. females ages 15 to 19 rose during the 1970s to 43 abortions per 1,000 females in 1980 but then became relatively stable through 1985 (8). Still, in 1985, the U.S. abortion rate among teenagers ages 15 to 19 was one of the highest in any country for which data are available (8). In 1985, the abortion rate for U.S. females ages 15 to 19 was 44 abortions per 1,000 females; thus, 4.4 percent of all women in that age group obtained an abortion in 1985 (8). Trends in the abortion rate for U.S. females ages 15 to 19 from 1973 through 1985 are shown in figure 10-7.

According to data from the Alan Guttmacher Institute, the abortion rate for U.S. females under age

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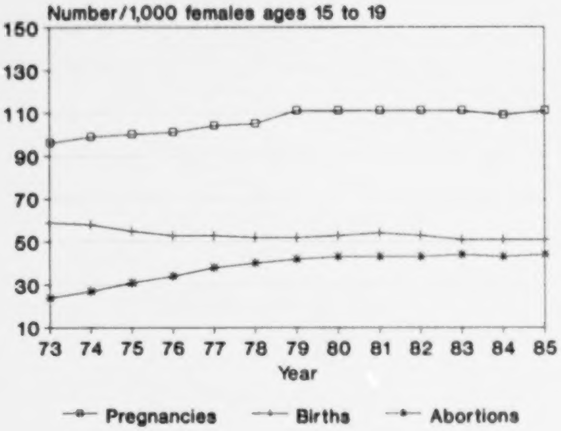
[8]See ch. 17, "Consent and Confidentiality in Adolescent Health Care Decisionmaking," in Vol. III for a discussion of U.S. Supreme Court decisions that may affect U.S. adolescents' access to abortion.

Figure 10-7—Trends in Pregnancy Rates, Birth Rates, and Abortion Rates Among U.S. Females Ages 15 to 19, 1973-85



SOURCE: Office of Technology Assessment, 1991, based on K.A. Moore and T.M. Stief, "Changes in Marriage and Fertility Behavior: Behavior Versus Attitudes of Young Adults," paper prepared for Child Trends, Inc., Washington, DC, July 1989.

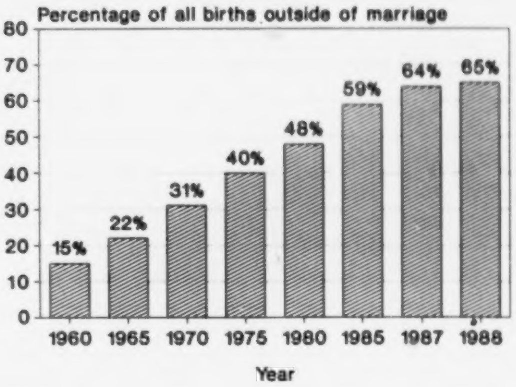
15 increased during the 1970s through 1985 (8). In 1973, the abortion rate among U.S. females under age 15 was 5.6 abortions per 1,000 females, in 1982, it was 8.3 abortions per 1,000 females (8). In 1985, it was 9.2 abortions per 1,000 females.

As noted earlier, the number of abortions reported to the Centers for Disease Control is lower than the number reported to the Alan Guttmacher Institute. In 1985, there were 1,328,570 legal abortions reported to the Center for Disease Control's abortion surveillance program, and 26.3 percent of these were to females under age 20 (202c). Thus, according to the Centers for Disease Control, there were an estimated 349,414 abortions among U.S. females under age 20 in 1985 (202c). The Centers for Disease Control noted that between 1972 and 1987, the proportion of abortions obtained by teenagers decreased steadily from 33 percent to 26 percent, reflecting in part upward shifts in the age of women in the population (202c).

Out-of-Wedlock Childbearing Among Adolescents

While the overall birth rate among U.S. adolescents has actually declined since the early 1970s, the birth rate among *unmarried* adolescents in this country has skyrocketed. As shown in figure 10-8, in 1960, less than one-fifth (15 percent) of all births to U.S. females under age 20 were to females who were not married (195c). In 1988, nearly 65 percent (322,406 births) of the 488,941 births to U.S. females under age 20 were to single mothers (195a,195c,207b).

Figure 10-8—Trends in Out-of-Wedlock Childbearing Among U.S. Females Under Age 20, 1960-88



SOURCE: Office of Technology Assessment, 1991, based on U.S. Congress, House of Representatives, Select Committee on Children, Youth, and Families, *U.S. Children and Their Families: Current Conditions and Recent Trends, 1989* (Washington, DC: U.S. Government Printing Office, 1989); U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Center for Health Statistics, Division of Vital Statistics, "Advance Report of Final Natality Statistics, 1988," *Monthly Vital Statistics Report* 39 (No. 4, suppl.), DHHS Pub. No. (PHS) 90-1120, Aug 15, 1990.

The proportion of out-of-wedlock births among younger adolescents has increased less dramatically since 1970 than the overall proportion for females under 20, in part because it was so high to begin with. In 1970, four-fifths (81 percent) of the births to U.S. females under age 15 were to females who were not married (195c); in 1985, more than nine-tenths (92 percent) of the births to U.S. females under age 15 were to females who were not married (207b).

What accounts for the increase in out-of-wedlock birth rates among U.S. adolescents is not exactly known. Some unmarried adolescents who become pregnant marry before they give birth, but the proportion of females conceiving who marry before giving birth has declined in recent years (148). In 1981, the proportion was 23 percent, down from about 31 percent in 1970 (148,154). The decline in the proportion of unmarried adolescents who marry before they give birth probably reflects changes in societal attitudes toward marriage. It may also reflect the inability of fathers who are high school dropouts to find jobs that provide sufficient income to support a family (166,195a).

Adolescent Fatherhood

Much of the talk about adolescent pregnancy focuses on females. Information on adolescent fathers is scarce and tends to be less reliable than similar data on adolescent females. One very limited source of information on the extent of adolescent fatherhood is the U.S. vital statistics system maintained by the National Center for Health Statistics of DHHS. The vital statistics system compiles data from State birth certificates on the ages of both mothers and fathers of children born in the United States. For about 40 percent of births to U.S. mothers under age 20, however, information about the child's father is not reported on the child's birth certificate (1,47a,52,203,207b). The percentage of mothers under age 15 who report information about their child's father is smaller than the percentage of mothers ages 15 to 19 who do, probably because younger mothers are also much less likely to be married than older adolescent mothers. Black adolescent females are substantially less likely to report the age of the father than white females.

In 1988, 18 percent of U.S. mothers ages 15 to 19 who *did* report the age of their child's father on their child's birth certificate reported the father's age as 15 to 19 (see table 10-1). The percentage of adolescent mothers under age 15 with adolescent males as partners is probably higher.

NLSY, which as mentioned earlier is a longitudinal survey of youth sponsored by the U.S. Department of Labor, has included questions about adolescent males' sexual behavior and parenthood experience since 1982 (128). Although NLSY is probably the best available nationally representative data source on adolescent male fertility and living arrangements it is unclear whether, and if so, to what extent, the available survey data accurately reflect the total population of adolescent males who have fathered a child. Even when adolescent males are asked, they do not always know that they have made a sexual partner pregnant or fathered a child. Even if they do know that they have fathered a child, they may be reluctant to acknowledge that fact, even in a survey where confidentiality is protected (1a).

According to Marsiglio, 6.8 percent (555) of the nationally representative sample of 5,550 young males surveyed in the 1984 round of NLSY (when the males surveyed were ages 20 to 27) reported that they had fathered a child before the age of 20 (128).[9] As shown in table 10-2, more than three-fourths (446) of these adolescent fathers reported that they had been single at the time of conception. One-third of those who were responsible for a nonmarital conception reported that they had married within 12 months of conception, and half of all the young men lived with their child shortly after the child's birth (128). As shown in table 10-2, three-fourths of the 555 males who had fathered a child before the age of 20 reported they were ages 18 or 19 at the time; these older adolescent fathers were more likely to report being married at the time of conception than younger ones (128). Sixty-two percent of adolescent fathers with a marital conception reported being high school dropouts, but all adolescent fathers—regardless of marital status at first birth—were much more likely to be high school dropouts than were other male teenagers.

NLSY data analyzed by Marsiglio indicate that black adolescent males, economically disadvantaged white adolescent males, and Hispanic adolescent males were all substantially more likely to become adolescent fathers than white adolescent males from nondisadvantaged backgrounds (128) (see table 10-3). Black adolescent males were especially likely to report having fathered a child out-of-wedlock. Furthermore, only 15 percent of black teenagers lived with their first child, as compared with 48 percent of Hispanics, 58 percent of disadvantaged whites, and 77 percent of nondisadvantaged whites (128).

Summary

An overview of U.S. adolescent pregnancy and parenting is presented in figure 10-9. The United States leads all other Western developed countries in its rates of adolescent pregnancy, abortion, and childbearing, although the age of initiation and rates of sexual activity in these countries are comparable (8,149). Although it is encouraging to note that the pregnancy rate among *sexually active* U.S. females ages 15 to 19 declined between 1970 and 1985, an increase in the pregnancy rate in this group between 1985 and 1987 is cause for concern.

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[9] All percentages reported in the Marsiglio article are weighted statistics, but reported sample sizes reflect actual frequency counts (128).

Table 10-1—U.S. Mothers and the Reported Age of the Fathers of Their Children, by Child's Race, 1988

			Age of father													
	Total		Under 15 years		15 to 19 years		20 to 24 years		25 to 29 years		30 to 34 years		35 years and over		Not stated	
Race of child and age of mother	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
All races, all ages[a]	3,909,510	100%	376	—%	110,685	3%	617,124	16%	1,055,417	27%	903,800	23%	636,741	16%	585,367	15%
Under 15 years	10,588	100	110	1	2,241	21	759	7	112	1	23	—	21	—	7,322	69
15 to 19 years	478,353	100	140	—	87,018	18	153,525	32	34,371	7	6,940	1	3,007	1	193,352	40
White, all ages	3,046,162	100	211	—	79,543	2	494,426	16	894,849	29	766,167	25	518,275	17	292,691	10
Under 15 years	4,073	100	26	—	1,031	25	498	12	69	2	18	—	17	—	2,414	59
15 to 19 years	315,471	100	83	—	61,959	20	119,525	38	27,089	9	5,347	2	2,256	1	99,212	31
Black, all ages	671,976	100	146	—	27,166	4	100,230	15	116,019	17	85,647	13	71,413	11	271,355	40
Under 15 years	6,182	100	80	1	1,137	18	208	3	32	—	3	—	3	—	4,719	75
15 to 19 years	146,326	100	49	—	22,046	15	28,588	20	5,604	4	1,222	1	583	—	88,234	60

NOTE: Percentages may not total 100 because of rounding. Percentages less than 1 percent are indicated by a "—".

[a] "All races" includes races other than white and black. Separate data for Hispanics are not available (see text). Hispanics may be either black or white.

SOURCE: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Center for Health Statistics, Division of Vital Statistics, "Advance Report of Final Natality Statistics, 1988," *Monthly Vital Statistics Report* 39(No. 4 suppl.), DHHS Pub. No. (PHS) 90-1120, Aug. 15, 1990.

Table 10-2—Adolescent Fathers: Distribution of Male Participants in the 1984 NLSY Who Reported Having Fathered a Child Before the Age of 20, by Father's Age at Child's Birth and Marital Status at Conception[a]

Father's age at child's birth	Males who reported having fathered a child before age 20[b]	Single at conception	Married at conception
	N = 555	N = 446	N = 109
Age 11 to 16	66 (10.1%)	66 (12.7%)	0 (0.0%)
Age 17	85 (15.8)	76 (18.3)	9 (5.8)
Age 18	181 (30.6)	158 (32.8)	23 (22.1)
Age 19	223 (43.5)	146 (36.2)	77 (72.0)
Age 11 to 19	555 (100.0)	446 (100.0)	109 (100.0)

[a] Data are from the 1984 round of National Longitudinal Surveys of Labor Market Experience—Youth Cohort (NLSY), sponsored by the U.S. Department of Labor. The survey was begun in 1979. In 1984, male participants were ages 20 to 27.

[b] The total number of males in the NLSY sample in 1984 was 5,550. According to Marsiglio, who used weighted statistics to report percentages (as noted in table 10-3), 6.8 percent of male participants in the 1984 NLSY reported that they had fathered a child before the age of 20.

SOURCE: Office of Technology Assessment, 1991, based on W. Marsiglio, "Adolescent Fathers in the United States: Their Initial Living Arrangements, Marital Experience, and Educational Outcomes," *Family Planning Perspectives* 19(6):240-251, 1987.

Table 10-3—Adolescent Fathers: Distribution of Male Participants in the 1984 NLSY Who Reported Having Fathered a Child Before the Age of 20, by Race/Ethnicity[a] [b]

		Race/ethnicity			
				White	
Marital status at conception and age at child's birth	Total (N = 5,550)	Hispanic (N = 858)	Black (N = 1,402)	Not poor (N = 2,475)	Poor (N = 815)
Percent of male participants who fathered a child before age 20	6.8%	10.9%	14.8%	4.6%	11.9%
Single	5.5%	7.0%	14.2%	3.4%	9.1%
Ages 11 to 17	1.7	2.6	5.8	0.7	3.4
Ages 18 to 19	3.8	4.4	8.4	2.7	5.7
Married	1.3%	3.9%	0.6%	1.2%	2.8%

[a] Data are from the 1984 round of the National Longitudinal Surveys of Labor Market Experience—Youth Cohort (NLSY) sponsored by the U.S. Department of Labor. The survey was begun in 1979. In 1984, male participants were ages 20 to 27.

[b] The NLSY is a nationally representative survey that includes 12,686 male and female respondents with an oversampling of blacks, Hispanics, and economically disadvantaged whites. These subgroups can be weighted to represent a national cross-section of American youth ages 14 to 21 as of January, 1979. All percentages reported in this table are weighted statistics, but reported sample sizes reflect actual frequency counts.

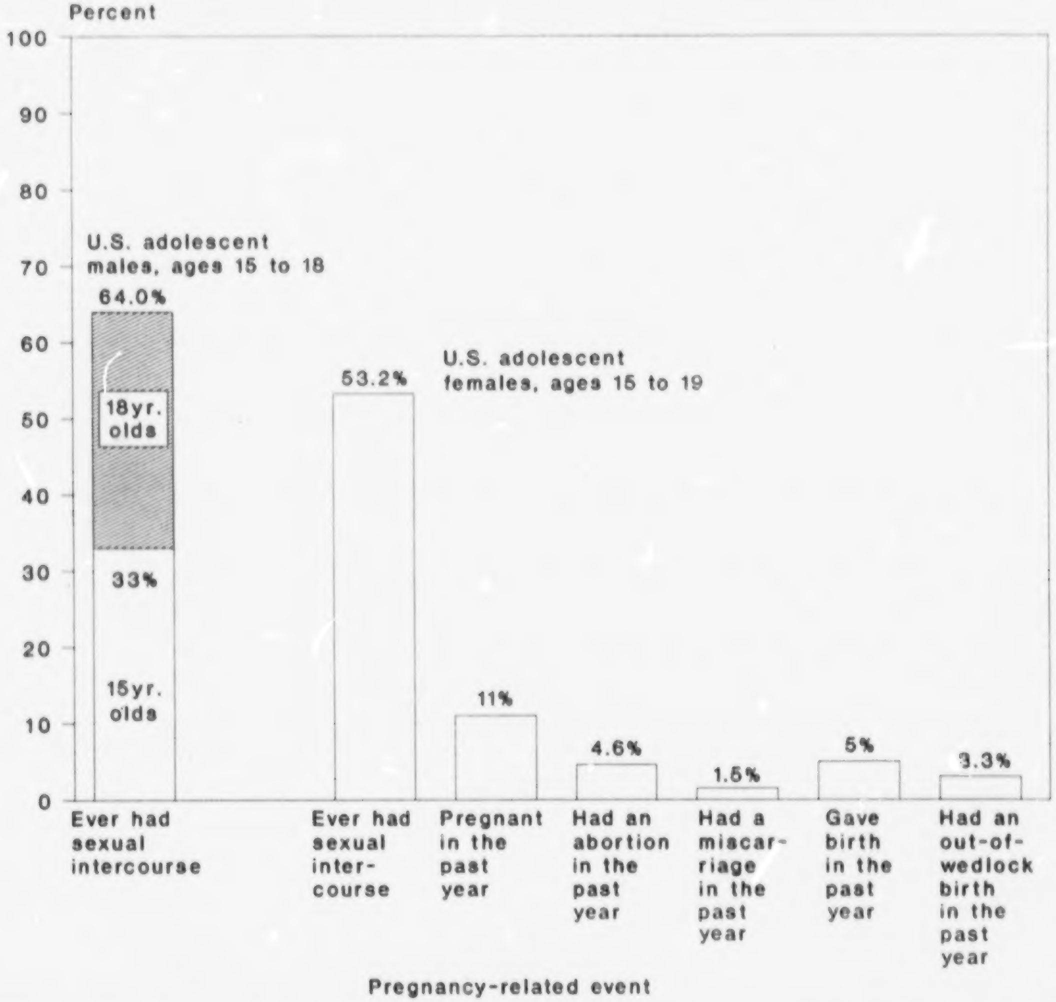
SOURCE: W. Marsiglio, "Adolescent Fathers in the United States: Their Initial Living Arrangements, Marital Experience, and Educational Outcomes," *Family Planning Perspectives* 19(6):240-251, 1987. Reprinted by permission.

Birth rates among U.S. adolescents as a whole seem to have leveled off since the late 1970s, after an initial sharp decline due to the legalization and increased availability of abortion. In 1988, however, birth rates among 10- to 14-year-old adolescents and among 15- to 17-year-old U.S. adolescents were at their highest levels in 10 years (202f). The reasons are not known. Another cause for concern is the fact that birth rates among black U.S. adolescents increased during the 1980s (202f). Again, the reasons are not entirely clear. There are about half a million births to adolescent mothers each year. It is troubling that the proportion of births to unmarried adolescents has increased dramatically in recent years, and currently, about two-thirds of births to adolescent mothers are out-of-wedlock births. Data from the U.S. vital statistics system, through limited, suggest that perhaps half of adolescent pregnancies involve males age 20 or above; the rest of adolescent pregnancies involve younger males as fathers.

Consequences of Adolescent Sexual Activity, Pregnancy, Abortion, and Parenthood

It is often assumed that adolescent pregnancy and childbearing are associated with a constellation of negative health, social, and economic outcomes for

Figure 10-9—Overview of U.S. Adolescent Pregnancy and Parenting[a]



[a] Percentages of sexual intercourse, pregnancies, and out-of-wedlock births were tabulated from 1988 data. Percentages of abortions, miscarriages, and births were tabulated from 1984 data. Percentages of adoptions were tabulated from 1982 data.

SOURCE: Office of Technology Assessment, 1991, based on data from the following sources: **Adolescent males ever had sexual intercourse:** F.L. Sonnestein, J.H. Pleck, and L.C. Ku, "Patterns of Sexual Activity Among Adolescent Males," paper presented at the annual meeting of the Population Association of America, Toronto, Canada, May 1990. **Adolescent females ever had sexual intercourse:** J.D. Forrest and S. Singh, "The Sexual and Reproductive Behavior of American Women, 1982-1988," *Family Planning Perspectives* 22(5):206-214, 1990. **Pregnant in the past year:** U.S. Congress, Congressional Budget Office, *Sources of Support for Adolescent Mothers* (Washington, DC: September 1990). **Had an out-of-wedlock birth in the past year:** U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Center for Health Statistics, Division of Vital Statistics, "Advance Report of Final Natality Statistics, 1988," *Monthly Vital Statistics Report* 39 (No. 4, suppl.), DHHS Pub. No. (PHS) 90-1120, Aug. 15, 1990. **All others:** National Academy of Sciences, National Research Council, Commission of Behavioral and Social Sciences and Education Committee on Child Development Research and Public Policy, Panel on Adolescent Pregnancy and Childbearing, *Risking the Future: Adolescent Sexuality, Pregnancy, and Childbearing, Vol. I,* C.D. Hayes (ed.) (Washington, DC: National Academy Press, 1987).

adolescents (196). As discussed below, however, not all adolescents experience these negative outcomes, and there is evidence that some of the negative outcomes may actually result from lack of prenatal care or other factors related to socioeconomic status rather than from adolescent pregnancy or childbearing per se (196). A better understanding of risk and protective factors in adolescent pregnancy and childbearing would undoubtedly be useful in developing appropriate interventions.

Consequences for Adolescents

Health Consequences of Early Sexual Activity—Adolescents who engage in sexual intercourse are at very high risk of immediate health consequences. One consequence for females, of course, is unintended pregnancy due to the failure to use effective contraception (47a). As noted below, different subgroups of adolescents are more likely to practice effective contraception than others. Younger adolescents, for example, are less likely to use effective contraceptive methods than older ones.[10]

Engaging in sexual intercourse places both male and female adolescents at very high risk of getting sexually transmitted diseases (STDs) and their related side effects, infection with human immunodeficiency virus (HIV), and the life-threatening acquired immunodeficiency syndrome (AIDS) (47a, 189). The risk of AIDS and some STDs can be reduced through the use of condoms and other measures discussed elsewhere in this Report.[11]

Health Consequences of Pregnancy and Childbearing—Pregnant adolescents are at risk for negative health outcomes including excessive weight gain during pregnancy, anemia, nutritional deficiencies, mild and severe toxemia of pregnancy, prolonged or abrupt labors, cephalopelvic disproportion, and maternal mortality (75a,134,137,189). The adolescents at highest risk are very young (under age 15), black, have a low gynecological age, are thin, are of low socioeconomic status, and do not seek prenatal care (75a). Some adolescents enter pregnancy with preexisting conditions that may produce negative outcomes (e.g., poor nutrition, anemia, STDs, substance abuse problems[12]). Thus, the problems they experience stem from those conditions. Many of the adverse outcomes that pregnant adolescents experience can be avoided by good nutrition and appropriate medical care (75a).

Health Consequences of Abortion—Like any surgical procedure, induced abortion carries some physical health risks (189). Length of gestation is the most important determinant of abortion complications (30,189). Part of the reason is that it determines the abortion method, and methods used later in pregnancy have higher risks of complications. Adolescents are twice as likely as older women to obtain an abortion after 12 weeks, and the youngest adolescents are most likely to delay seeking an abortion (30,189).

The most comprehensive analysis of complications of abortions among adolescents, by Cates and his colleagues, was based on data for legal abortions performed in the 1970s (30,189). The Cates analysis found that the overall rate of major complications following abortion by suction curettage at 12 weeks gestation or earlier was similar for teens and older women (between 1 and 2 per 1,000 in 1975-78) (30,189). Complication rates associated with abortion by dilatation and evacuation or saline administration were lower for teenagers than for any other age group. The Cates analysis found that between 1972 and 1978, the risk of dying from a legal induced abortion was lower among adolescents than among older females. Within lengths of gestation, adolescents had the lowest death rates.

Cates concluded that the physical health risks of induced abortion for teenagers were generally no greater than the risks for older women (30,189). The one exception was the greater risk of cervical trauma among teenagers. Adolescents who experience cervical trauma following induced abortion may be at increased risk for adverse outcomes in subsequent pregnancies.[13]

A 1989 report by then Surgeon General C. Everett Koop stated that firm conclusions regarding the psychological effects of abortion were not possible (largely because of serious flaws in much of the existing research), but the Surgeon General's report did not specifically address psychological effects of abortion for adolescents (209). Adler and colleagues' review of the most recent methodologically sound studies of psychological responses of U.S.

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[10] The effectiveness of contraceptive methods most commonly used by U.S. adolescents is discussed later in this chapter.

[11] The risk of HIV infection, AIDS, and other STDs among U.S. and adolescents and measures to prevent these diseases are discussed in ch. 9, "AIDS and Other Sexually Transmitted Diseases: Prevention and Services," in this volume.

[12] The special nutritional needs of pregnant adolescents are discussed in ch. 7, "Nutrition and Fitness Problems: Prevention and Services," in this volume. Substance abuse problems among adolescents are discussed in ch. 12, "Alcohol, Tobacco, and Drug Abuse: Prevention and Services," in this volume.

[13] The effect of a prior induced abortion on subsequent pregnancy outcomes has not been specifically evaluated for adolescents. Given the increased risk of cervical injury as a complication among adolescents and its possible association with subsequent unfavorable pregnancy outcomes, research on the delayed effects of induced abortion among adolescents seems warranted (189).

women after obtaining legal abortions found that women often experience particular distress before an abortion but that legal abortion during the first trimester of their pregnancy does not pose a psychological hazard for most women (4). Several studies have found that adolescents experience more negative emotional reactions immediately following an abortion than women over age 19 do (3,20,126). This finding may reflect the older women's greater ability to make use of their support networks to resolve negative emotions following an abortion (11,62). Adler and Dolcini note, however, that statistically significant differences between adolescents' and adults' psychological reactions to abortion are small, and negative reactions of both groups are generally mild (5). Some distress preceding an abortion is to be expected.

Studies of the long-term psychological impact of abortion on adolescents are rare. A recent study that followed 360 black, urban adolescents who received a pregnancy test in Baltimore found that adolescents who obtained an abortion were no more likely to have psychological problems 2 years later than were adolescents who carried their pregnancies to term or whose pregnancy test was negative (225).

Social and Economic Consequences of Parenthood—According to Dryfoos, adolescent mothers face "a myriad" of short- and long-term problems, as do the babies they bear, the fathers, their families, and, ultimately, their communities (47a). One problem that researchers have confronted in attempting to document the consequences of parenthood for adolescents as compared with the consequences for older women, however, is determining the effects of low socioeconomic status and race apart from age (47a).

In the short-term, adolescent mothers frequently report many stresses in their lives: reliance on their family of origin, unstable relationships with the child's father and other male partners, unusual rates of physical health problems for themselves and their children, economic hardships, school changes, family conflict, loneliness, isolation, and depression (16,55,102).

The relationship between adolescent parenthood and educational attainment is a complex one, especially among females (185c). A number of studies have found that females who have babies while in junior or senior high school complete on average fewer years of school than their peers who delay childbearing until their twenties and are less likely to receive a high school degree or to attend college or graduate school; these studies have found that the younger the adolescent, the greater the effect (29, 145,66). In studies conducted several years ago, as many as three-quarters of female dropouts cited pregnancy and/or marriage as their reason for leaving school (185c). As discussed below, however, females who become adolescent mothers tend to be those who lack basic skills and are low achievers in school (47a). Thus, poor academic performance may be a precursor of pregnancy and motherhood rather than a consequence. Using data from NLSY, Upchurch and McCarthy found that female adolescents who had a baby while still enrolled in school and who remained in school were just as likely to graduate as adolescents who did not have babies (195). Female high school dropouts who had a baby, however, had their chances of eventual graduation from high school reduced.

Some studies have found that adolescent mothers tend to have lower status jobs and lower incomes than other females and that they are more likely to depend on public assistance (29,70,89); it is suggested that part of the reason may be that females who give birth during adolescence tend to have more subsequent births at closer intervals than their peers who delay childbearing (90). Economic outcomes are substantially brighter for adolescent mothers who marry and maintain stable marital relationships than they are for other adolescent mothers (67). As noted earlier, most births to adolescents, especially blacks, occur outside of marriage. Furthermore, adolescent marriages are very likely to end in divorce, and adolescent cohabitational relationships are even more unstable than adolescent marriages (14,29,66,67).

Recently, a couple of longitudinal studies have found that there is great variability in how adolescent parenthood affects adolescent mothers' educational and vocational attainment. Furstenberg and colleagues conducted a longitudinal study that followed a group of mostly urban black adolescent mothers in Baltimore and their children for 17 years (68,68a). They found a great deal of diversity in how these mothers, who gave birth as adolescents in the middle to late 1960s, responded in the long run to the setback in education and labor force participation associated with adolescent childbearing and parenthood. Women who had more economically secure and better educated parents and women who had been doing well in school and had high educational aspirations at the time of their child's birth were much more likely to be successful later on.

At 5-year followup in 1972, Furstenberg and colleagues found, most of the 331 mothers were in their early twenties and were struggling to remain in or return to school, to enter the job market and to raise their child (68,68a). Close to one-third of the young women were receiving welfare. Only 50 percent of the women had graduated from high school. Having more children at a young age was found to constrain these mothers' ability to pursue their education or get job experience. The mothers who had had more children in the 5 years did less well in school, had lower aspirations, and came from more socioeconomically disadvantaged families than those who had no subsequent children.

At 17-year followup in 1984, Furstenberg and colleagues found that a substantial majority of the Baltimore adolescent mothers had returned to school, had gotten off welfare, and were employed in stable jobs (68,68a). Relatively few had ended up with large families. Nevertheless, barely more than one-third were married, and in comparison with samples from several national surveys, the Baltimore mothers were not as successful as metropolitan black women who had delayed childbearing until their early twenties. Women who had attended a special school for pregnant women were more likely to be economically independent at followup.

This study by Furstenberg and colleagues suggests that adolescent parenthood does not inevitably lead to a life of poverty and disadvantage for adolescent mothers (68).[14] Furstenberg and colleagues caution, however, that the situation confronting the sample of mothers in their study may be very different from that of pregnant teenagers today. During the mid-1960s, for example, abortion was illegal, and early childbearing was not considered a problem so long as it was accompanied by marriage; thus, many women married to avoid the stigma of unwed parenthood. Special services for adolescent mothers were less available 20 years ago than they are today. In drawing conclusions about the implications of the Furstenberg study's findings for today's adolescent mothers, these changes should be kept in mind. The effects these changes are likely to have are not really known.

Horwitz and colleagues investigated the long-term effects of school-age pregnancy in a 20-year followup of women who were pregnant adolescents in the late 1960s (92a). The study population consisted of 154 black women who had been enrolled in a program that offered obstetric, social, and educational series to pregnant teenagers. This study also found that the life course and long-term outcomes for adolescent mothers were not homogeneous. Long-term success, defined as being currently employed or supported by a spouse *and* having a high school education or its equivalent, had been achieved by 62 percent of the women in this study at 20-year followup. Long-term success was associated with six factors: 1) having completed more school prior to becoming pregnant, 2) participating more extensively in life skills training sessions offered to them as pregnant adolescents, 3) being in school with no subsequent pregnancies at 26 months postpartum, 4) feeling in control of one's life at 26 months postpartum; 5) experiencing little social isolation at 26 months postpartum, and 6) lifetime fertility control defined as one or two children after the first.

The educational attainment of male adolescents who become fathers during their teenage years has been found to be negatively affected by parenthood but to a lesser extent than the educational attainment of adolescent mothers (29,128). Data from the 1984 round of NLSY suggest that adolescent fathers whose first child is conceived within marriage have the poorest high school completion patterns (128). A number of questions remain about whether adolescent fathers who live with a child they have fathered are harmed in their educational careers, and if so, under what conditions (128).

Psychological Consequences of Giving Up a Baby for Adoption—Adoption is a relatively rare event, and the process of formalizing adoption decisions has been highly confidential, so research data have been difficult to obtain. Some data indicate that placing a child for adoption results in a grieving process that may affect many aspects of a young woman's life (44) and that mothers who give their children up for adoption experience a variety of negative psychological consequences (162). The studies from which these data are drawn have been based on small, self-selected samples and have not concentrated on adolescents, however, so their applicability to the general population of adolescents who give babies up for adoption is limited.

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[14] The study's findings with respect to outcomes for the children of adolescent mothers were less positive, as discussed below.

A 1988 study comparing female adolescents who chose to give up a baby for adoption with female adolescents who chose to keep their baby found that both groups of adolescent mothers experienced a decline in satisfaction with themselves and their lives which closely followed their decisions to give up or to keep their baby (133). But when researchers followed up the two groups of adolescent mothers at least 6 months later, they found no differences between the two groups in overall levels of self- or life satisfaction (133). Adolescent mothers who chose to keep their babies were slightly more satisfied with their decisions than adolescent mothers who chose adoption.

Consequences for Children of Adolescent Parents

Health Consequences—Babies born to adolescent mothers (especially adolescent mothers under age 15) are more likely to be premature or low birthweight and are more likely to require hospitalization within the first 5 years of life than babies born to women age 20 and over (71b,84,190,196). The risks of prematurity and low birthweight can be reduced with adequate prenatal care. Furthermore, the fetus of an adolescent is at *less* than average risk in some respects (e.g., fetal death), and many children born to adolescent mothers tend to grow better in the earlier years of life (71b).

Some studies suggest that the children of adolescent parents are at increased risk of cognitive deficits, tend to perform less well in school than children born when their parents were older, and are more likely to exhibit behavior problems in school (14,70,106,120,140). Some data suggest higher rates of abuse and neglect among children of adolescent mothers (105,176), but such outcomes seem to be affected by socioeconomic factors; when the effects of socioeconomic variables are controlled, apparent differences between the children of adolescents and older mothers are substantially reduced, although not completely eliminated (148,196).

Social and Other Consequences—Furstenberg and colleagues' longitudinal study of mostly poor black adolescent mothers and their children in Baltimore found that the offspring of their sample of mothers who gave birth in the mid-1960s were at greater risk of developing problems in late adolescence and early adulthood than the children of older mothers interviewed in the National Survey of Children who did not give birth as adolescents (70). The children of the Baltimore mothers were interviewed at 5-year followup (when they were preschoolers), at 17-year followup (when they were adolescents), and at 20-year followup (when they were ages 18 to 21).

At 17-year followup, the Furstenberg study found that the frequency of school failure, delinquency, emotional difficulties, and other problem behaviors was much greater among the children of the adolescent mothers than among children of older mothers in the National Survey of Children (70). At 20-year followup, the children of the Baltimore adolescent mothers were not doing as well as the children of older mothers in the National Survey of Children, but the differences were not as large as some observers might have been expected. Sixty-three percent of the children of the Baltimore adolescent mothers had completed high school or obtained a high school equivalency degree and another 10 percent seemed likely to do so. Still, a conspicuous minority had dropped out of school (23 percent) or had spent time in jails or correctional institutions (17 percent), and a substantial proportion were experiencing symptoms of depression (32 percent).

Because of its ability to follow families over generations, the Furstenberg study was also able to address the important and controversial issue of the transmissibility (e.g., through parental socialization or modeling) of adolescent childbearing between generations. This study found that early childbearing was at least indirectly involved in increasing the chance that one's child would become an adolescent parent (daughters of women who had given birth at ages 14 to 17 were more likely than those whose mothers were 20 or older at their first birth to themselves give birth as adolescents). On the other hand, the great majority (two-thirds) of the children of adolescent mothers did not become parents before age 19 (68,70).[15]

Furstenberg and colleagues unfortunately found that the second-generation adolescent mothers were not faring as well as their mothers had and predicted worse outcomes for them than for their mothers in terms of educational achievement, marriage, and welfare dependence (68,70). The second-generation adolescent mothers were almost twice as likely as their mothers to have failed a grade in school (57 percent v. 33 percent), were less likely to have married (14 percent v. 60 percent), and were more likely to be on welfare (60 percent v. 30 percent). Furstenburg and colleagues concluded that "second-generation teenage mothers in the 1980s appear more vulnerable to long-term dependence and probably less equipped to maneuver their way out of lifelong disadvantage than were their mothers in the 1960s" (68). They recommended that second-generation adolescent mothers be targeted for extensive educational and social services (68).

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[15] It may be important to note that because not all women in their sample had reached ages 14 to 18, the researchers calculated probabilities based on the experiences of the sample that was available (70).

Risk and Protective Factors in Adolescent Pregnancy and Parenting

In recent years, researchers have documented a number of potential risk and protective factors related to adolescent pregnancy and parenting. Much of the available research was recently reviewed in a comprehensive analysis of adolescent pregnancy and parenting by the National Academy of Sciences' Panel on Adolescent Pregnancy and Childbearing (148,149), and that information is summarized, along with other information, below. It is important to note that there is still a paucity of methodologically sound research on the precursors to adolescent pregnancy and postpregnancy decisions.

In an attempt to capture the many factors that may be associated with the determinants and outcomes of pregnancy resolution decisions made by adolescent females and their male partners after conception, Marsiglio recently presented the conceptual model shown in figure 10-10. As shown, the factors affecting the pregnancy resolution decision alone have many determinants, including the social structure; cultural and subcultural values and norms; policies and programs; the flow of financial resources and social support from family, friends, and partner; and the adolescents' own attitudes, aspirations, and resources. The decisions made as a result of these factors affect the process and outcomes of a pregnancy-related decision, which in turn affect the life-style adaptations made by the couple and their future life options and well-being. What is perhaps more important to note is that these factors often interact with each other in causally complex ways and that each couple's decision in turn affects the cultural values and norms of other contemporaneous couples and succeeding generations.

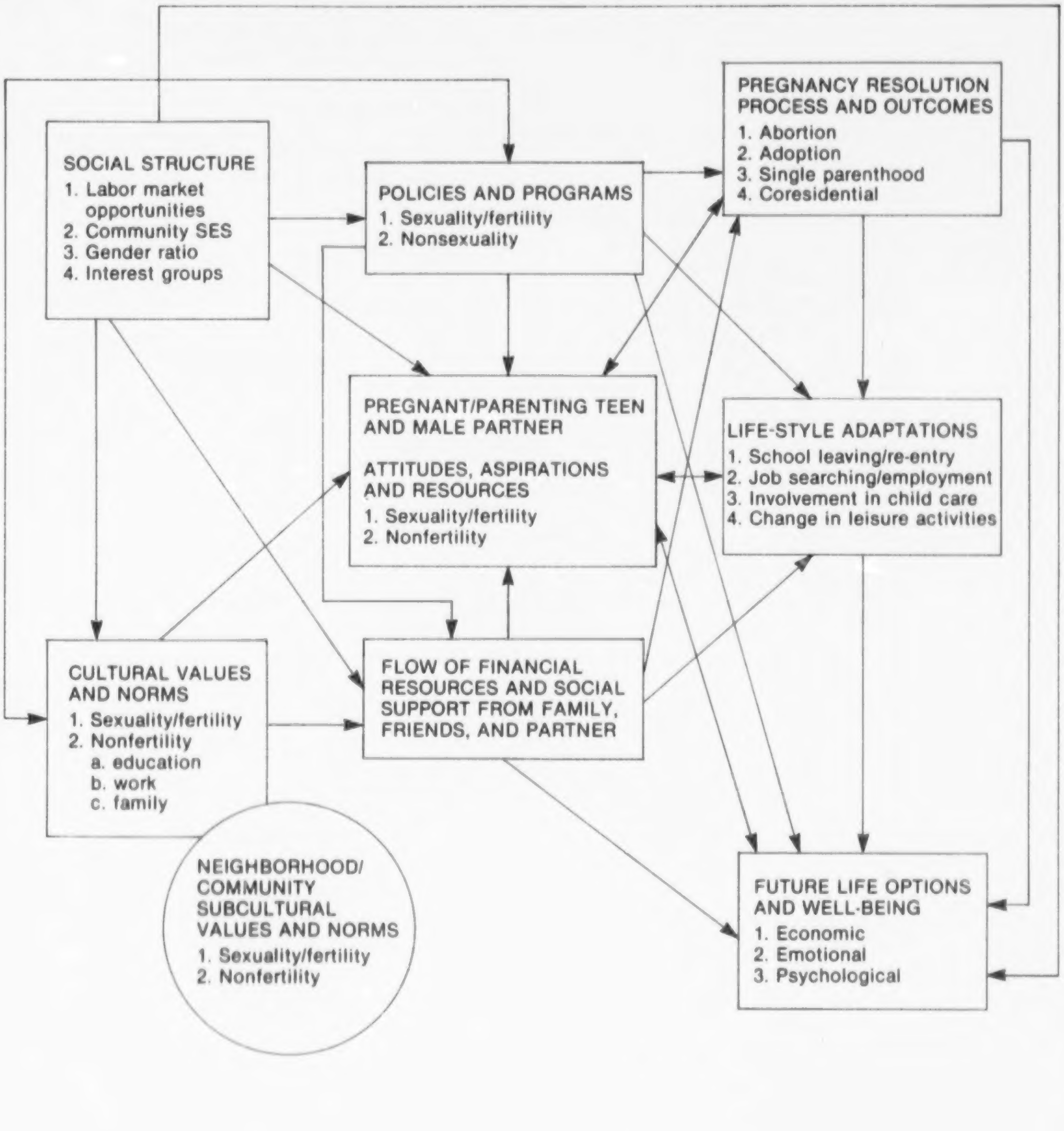
Models similar to the one shown in figure 10-10 could be constructed for the decisions that may lead to a pregnancy: whether to initiate sexual activity at all, whether to initiate sexual activity with a particular partner, whether to use contraception, and what method of contraception to use. Each of these decisions has its own set of determinants. Longitudinal research focusing on the psychological, social, and economic determinants of pregnancy and pregnancy outcomes would be useful in resolving some of the questions about risk and protective factors in adolescent pregnancy and parenting (171b).

Numerous individual, familial, and social/environmental factors related to pregnancy and pregnancy outcomes among adolescents are discussed below. Factors affecting all events that can lead up to a pregnancy (i.e., sexual intercourse, use or nonuse of contraceptives) are discussed below as *"factors related to pregnancy,"* and factors affecting events that may occur during or after a pregnancy (abortion, complications during pregnancy, childbearing, adoption, parenting) are discussed as *"factors related to pregnancy outcomes."*

Risk and Protective Factors Related to Pregnancy

Individual Factors Related to Pregnancy—Two strong predictors of adolescent pregnancy are the initiation of sexual activity at an early age and engaging in unprotected sexual intercourse (i.e., intercourse without the use of effective contraceptives). Females who first have intercourse at age 15 or below have been found to be nearly twice as likely to get pregnant in the first 1 to 6 months of sexual activity as adolescents who wait to have intercourse until they are 18 or 19 (228a). One of the reasons is that older adolescents who become sexually active are considerably more likely than younger adolescents to use contraception and to use it effectively (229). In general, the older an adolescent female is, the more likely she is to report using some form of birth control when she is sexually active (229,231), and the older she is when she begins having sex, the

Figure 10-10—Conceptual Model for Pregnant/Parenting Teens and Their Male Partners: Pregnancy Resolution Decisions, Life-Style Adaptations, and Well-Being


SOCIAL STRUCTURE
1. Labor market opportunities
2. Community SES
3. Gender ratio
4. Interest groups
POLICIES AND PROGRAMS
1. Sexuality/fertility
2. Nonsexuality
PREGNANCY RESOLUTION PROCESS AND OUTCOMES
1. Abortion
2. Adoption
3. Single parenthood
4. Coresidential
PREGNANT/PARENTING TEEN AND MALE PARTNER
ATTITUDES, ASPIRATIONS AND RESOURCES
1. Sexuality/fertility
2. Nonfertility
LIFE-STYLE ADAPTATIONS
1. School leaving/re-entry
2. Job searching/employment
3. Involvement in child care
4. Change in leisure activities
CULTURAL VALUES AND NORMS
1. Sexuality/fertility
2. Nonfertility
a. education
b. work
c. family
FLOW OF FINANCIAL RESOURCES AND SOCIAL SUPPORT FROM FAMILY, FRIENDS, AND PARTNER
NEIGHBORHOOD/ COMMUNITY SUBCULTURAL VALUES AND NORMS
1. Sexuality/fertility
2. Nonfertility
FUTURE LIFE OPTIONS AND WELL-BEING
1. Economic
2. Emotional
3. Psychological

SOURCE: W. Marsiglio, "Pregnant Teens and Pregnancy Resolution Decisions: The Role of Male Partners," *TEC Networks*, Newsletter of the Too-Early-Childbearing Networks of Programs Funded by the Charles Stewart Mott Foundation, Washington, DC, No. 29, June 1991. Reprinted by permission.

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more likely she is to use contraception at first intercourse (235).[16]

According to the comprehensive review of adolescent pregnancy and parenting by the National Academy of Sciences' Panel on Adolescent Pregnancy and Childbearing, research suggests that a number of factors are strongly associated with the *initiation of sexual activity* before marriage (148). Among the most important are individual characteristics such as physical maturation level, age, race, socioeconomic status, religiousness, intelligence and academic achievement, and dating behavior.

There is almost universal agreement that early pubertal development (e.g., age of menarche for females, body development and hormonal development for males) is strongly associated with early initiation of sexual activity (148). During the period of adolescence, young people undergo dramatic biological changes that give them the capacity to create children. U.S. females today first menstruate, on average, at age 12$^1/_2$ (with a range between 8 and 16), but in some cases, they cannot get pregnant for at least a year (47a). Boys are able to father children at age 14 or so, although they can and sometimes do engage in sexual intercourse before that. Studies provide evidence for the hormonal basis of sexual motivation and behavior among white males. For white females, sexual behavior (as opposed to interest) seems to be influenced more by social environment than by physical development. There are no comparable data on black adolescents.[17]

Apart from pubertal development, age is associated with the initiation of sexual activity. The older an adolescent is, the more likely he or she is to have had sexual intercourse (148).

Race is also associated with the initiation of sexual intercourse. Black males and females become sexually experienced on average 2 years earlier than white males and females (148,187). As discussed later in this chapter, there is disagreement over the cause of racial differences in the proportion of adolescents who are sexually active and the age of sexually initiation (e.g., subcultural values and attitudes regarding the acceptability of early sexual behavior, residence in socioeconomically disadvantaged neighborhoods) (148).

Religiousness (the tendency to be devout and observant of religious custom, regardless of religious affiliation) appears to be a factor that distinguishes early and late initiators of sexual activity (43,148,231).

A number of studies indicate that there is a strong association between low intellectual ability, low academic achievement, a lack of educational goals, and early sexual experience among both black adolescents and white adolescents (148). Male and female adolescents with higher levels of academic achievement and higher educational and life goals are less likely than other adolescents to engage in sexual intercourse during their early adolescent years, and they are more likely to make consistent use of contraceptives when they do have intercourse (43,98a,139). Adolescent females who are experiencing academic problems, who have low academic and career expectations, and particularly those who have dropped out of school are more likely to initiate sexual activity at an early age than those who are more academically successful and ambitious (148,149). The association between ability, educational aspirations, and life goals and the lower likelihood of early sexual experience is undoubtedly tied to several interacting social, economic, psychological, and situational variables (148).

Research findings suggest that adolescents who begin dating early are likely to have early sexual experience (148). Research also suggests that adolescents who become sexually active at an early age are also often involved in other behaviors that push toward independence and adulthood (e.g., smoking, drinking, and drug use) (148).

A factor in adolescent sexuality and pregnancy that may be important but that is rarely analyzed or discussed is adolescent females' perceptions about their roles as women (56a,149,122,145a). Lewin found, for example, that college-aged women felt that it was psychologically more cost-beneficial to accept unwanted sexual intercourse than to refuse it (122).[18] The review by the National Academy of Sciences' Panel on Adolescent Pregnancy and Childbearing suggested that adolescents' increasing exposure to working women and single mothers could be expected to influence the desirability of early childbearing in diverse ways (149).

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[16] Data on reported contraceptive use among adolescent males are very limited, but what little information there is suggests that age has little effect on adolescent males' use of birth control methods (142); older adolescent males are no more likely to report using birth control methods than are younger males.

[17] One issue of importance is the extent to which initiation of sexual intercourse is voluntary or forced (i.e., the result of rape or incest) (86a). Currently, there is no reliable information about this at the national level.

Not surprisingly, sexually active females who practice *effective contraception* are less likely to experience an unintended pregnancy than those who do not (235).[19] As noted earlier, the older an adolescent female is at the time of initiation of sexual activity, the more likely she is to use contraception and to use it effectively (148). The older a female is, the more likely she is to use a prescription method of contraception such as the pill (148,231). Among males, age appears to have little effect on contraceptive use at first intercourse (148).

According to the review by the National Academy of Sciences' Panel on Adolescent Pregnancy and Childbearing, studies have found that, in addition to the age at initiation of sexual intercourse, several factors are strongly associated with contraceptive use by unmarried, sexually active adolescents. These include having a stable relationship with a sexual partner, knowledge of reproduction and contraception, acceptance of one's own sexuality, academic aspirations, developmental characteristics, and parental support for the use of contraception (148).

Adolescents who are involved in a committed relationship (e.g., are "going steady") are more likely to use contraceptives than adolescents who do not have strong ties to one partner (148). One study found this observation to hold for black adolescents in particular (143).

Some observers have attributed sexually active adolescents' failure to use contraceptives to their lack of knowledge about reproduction and contraception (231). Although most U.S. adolescents appear to know that a girl can become pregnant if she has intercourse, significant numbers of U.S. adolescents—especially young adolescent females—appear not to know what time of the month entails a higher rate of pregnancy, that they can get pregnant at first intercourse, that infrequent sex can lead to pregnancy, and other facts about pregnancy risk and birth control that are more well known to sexually active adults (26a,137,248). At least one study has found that adolescents who have had sex education are more likely to be knowledgeable about reproduction and contraception than adolescents who have not had sex education (107).[20]

Regular and effective contraceptive use among adolescent females has been found in some studies to be associated with adolescents' acceptance of their own sexual behavior (223,248). Some adolescents, especially younger adolescents, who delay using contraceptives (often for up to a year) after they start having sexual intercourse, may do so because they have difficulty coming to terms with their own sexuality (148). Positive attitudes toward contraception and low levels of guilt about sexual activity are strongly associated with effective contraceptive use (148). Fear that contraception will have negative health effects and interfere with pleasure has also been found to be related to less frequent contraceptive use (148).[21] Adolescent females who believe contraception is the female's responsibility are likely to be more effective contraceptors (148,168,232).

Female adolescents (blacks and whites) who have clear educational goals and expectations and are performing well in school appear more likely to use contraception than those who lack a strong achievement orientation (148). Some studies have found that adolescents who become teenage mothers are performing below grade level at the time they become pregnant (68,148), suggesting a relationship between school achievement and the likelihood of pregnancy (148).

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[18] Contraceptive use during unwanted sexual intercourse was not measured in this study of hypothetical situations.

[19] It is important to note that, for as yet unknown reasons, the percentage of adolescents who use contraception and experience contraceptive failure in terms of preventing pregnancy is generally higher than the percentage of older women who experience contraceptive failure. Contraceptive failure rates for adolescents are shown in figure 10-12 later in this chapter.

[20] The relationship between gains in knowledge about conception and contraception through sex education courses and adolescents' sexual activity or use of contraceptives is not fully understood, but it seems that information alone is not sufficient to change adolescents' sexual behavior. As discussed later in this chapter, a 1984 study by Kirby found that while sex education programs did increase adolescents' knowledge about conception and contraception, they had little impact on whether adolescents became sexually active or used contraception (107). Various studies on the effectiveness of efforts to prevent adolescent pregnancy through school-based sex education/family life education classes, parent-child communication programs, and other informational programs are discussed later in this chapter.

[21] The types of contraceptives available to adolescents and some of their advantages and disadvantages are discussed later in this chapter. Also discussed are various programs that make contraceptives available to adolescents.

Some research has found that adolescent females who have a high level of self-esteem and believe they have a large measure of control over their lives are more likely to be effective users of contraceptives than adolescents who have low self-esteem and lack a sense of competence (148). Adolescent females who tend to be passive and to hold traditional views of male-female relationships tend to be poor contraceptors (148). Adolescents who are impulsive and like to take risks are more likely to be poor users of contraceptives than other adolescents (148).

Some research indicates that adolescents who use illicit drugs other than marijuana are at especially high risk for experiencing a premarital pregnancy (223b). Such adolescents are especially likely to engage in early sexual experimentation and to have permissive attitudes about sexual behavior (223b). Elliott and Morse found in a large national sample that among young men and women ages 15 to 21 in 1981, the proportions sexually active in the last year ranged from 21 percent among those who used no drugs, to 45 percent among those who used marijuana, and to 89 percent among those who experimented with illicit drugs other than marijuana (51a).

Several studies indicate that female adolescents who have good lines of communication with their mothers and whose mothers discuss contraception with them in a positive way are more likely to be effective contraceptors than adolescents who lack such communication (57a,60,148).[22] Furthermore, female adolescents whose mothers support them in selecting and using contraception seem to be more consistent in their own use of contraception (118,148).

Familial Factors Related to Pregnancy—According to the comprehensive review of adolescent pregnancy and parenting by the National Academy of Sciences' Panel on Adolescent Pregnancy and Childbearing, research examining the role of family members on adolescents' sexual behavior and contraceptive use is limited (148). Most studies in this area have examined mother-daughter relationships, ignoring the role of fathers and the relationship of parents to sons. Nevertheless, several studies have shed some light on family factors related to adolescent pregnancy and childbearing.

One of the factors that has been found to be most strongly associated with an adolescent female's *initiation of sexual activity* before marriage is the sexual and fertility experience of her mother (148). Several studies have found a strong relationship between a mother's sexual and fertility experience as a teenager and that of her daughter (148,152). The earlier the mother's first sexual experience and first birth, the earlier the daughter's experience is likely to be (148).

Other family factors that "appear to affect the level and quality of parental support and controls, and perhaps in turn influence sexual behavior among teenagers," include family intactness, family composition, and mother's age at marriage (148). Several studies have also shown that females who have grown up in fatherless families are more likely to initiate sexual activity at an early age than those who have grown up in two-parent families (139a,148,152). One study found that females in families with large numbers of siblings are also likely to become sexually active at an early age (91,148). The mechanism by which these factors influence the initiation of sexual activity is not well understood. Several plausible explanations have been offered (e.g., girls in fatherless families may seek affection in sexual relationships) but have not been substantiated (148).

Some studies have found that adolescents' sexual behavior is affected by the nature of their relationships with their mothers (148). Specifically, adolescent girls whose mothers do not combine affection with firm, mild discipline and set clearly defined limits on behavior are likely to engage in premarital sexual intercourse (148). In addition, as suggested in the previous section, some studies have found that adolescents in homes where there is good communication between parents and adolescents about sex tend to engage in less sexual activity and to make better use of contraceptives and that parental support for adolescents in seeking family planning services results in more consistent contraceptive use (60,118, 96). According to Hofferth, writing in the report of the National Academy of Sciences' Panel on Adolescent Pregnancy and Childbearing, however, parent-child relationships and parent-child communication seem to have an ambiguous association with the initiation of sexual activity and use of contraception by adolescents (86a,148). Thus, "there is no clear implication for program development" (148).

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[22] See ch. 3, "Parents and Families' Influence on Adolescent Health," in this volume for a discussion of the importance of parents in adolescents' lives.

Social/Environmental Factors Related to Pregnancy—Research on how peers influence adolescents' sexual attitudes and behavior is limited and exhibits a number of methodological problems (e.g., data are gathered at one point in time, so delayed effects cannot be detected). Several studies indicate that same-sex peers are a major source of information for adolescents about sex (148), and at least one study has found that the proportion of their same-sex peers that teenagers believe are sexually active and how sexually active they perceive them to be are strong predictors of *sexual experience* among adolescent males and females (38,148). Some research has suggested that adolescents' sexual behavior is influenced more by their perceptions of peers' attitudes and behavior than by what their friends actually do and think (148,151). The influence of peer pressure seems to vary by age and gender (148). Younger adolescents (i.e., those below the age of 15), especially white females, seem to be more susceptible to peer influences in sexual decision-making than others (123,148).

Although the influence of television on adolescents' sexual behavior has been little studied, it is clear that television is a predominant aspect of the lives of today's adolescents. Studies show that both explicit and implicit sexual behavior in television programming increased dramatically during the 1970s (148). Contraception is almost never mentioned or referred to, and the negative consequences of an unintended pregnancy are seldom portrayed (148).

Knowledge of how neighborhood environments and community institutions such as schools and churches affect sexual activity is just beginning to emerge (148). Adolescents who live in poor neighborhoods in which early childbearing and single parenthood are the norm are more likely to become sexually active and become pregnant than adolescents living in and going to school in more prosperous environments (9c,149).

An overview of the effectiveness and other features of *contraceptive* methods available to U.S. adolescents is presented later in this chapter. Research suggests that some adolescents find these methods difficult to use or otherwise unappealing and are therefore inconsistent or ineffective contraceptors (148).

As discussed later in this chapter, support for public and private nonprofit family planning clinics that serve adolescents and other, predominantly low-income, women is provided through Title X of the Public Health Service Act and other Federal, State, local government, and private programs.[23] Expansion in the availability of contraceptives and abortion during the 1970s was paralleled by an increase in adolescent sexual activity. Critics of family planning programs suggest that the availability of contraceptive services has caused higher rates of sexual activity and unintended pregnancy among U.S. adolescents (148). As noted later in this chapter, available research findings on this point are contradictory (e.g., 100,138).[24]

Risk and Protective Factors Related to Pregnancy Outcomes

Individual Factors Related to Pregnancy Outcomes—Adolescents who become pregnant may decide to have an abortion, or deliver their infants and keep them, or deliver them and give them up for adoption. Mothers who bear children out of wedlock may remain single, cohabit without marrying, or get married.

According to the National Academy of Sciences' 1987 report on adolescent programming and childbearing, one of the most important factors affecting whether a pregnancy is terminated by *abortion* or carried to term is whether it was intended (148). Adolescents who report that their pregnancy was unintended are more likely to have an abortion than those who report that their pregnancy was intended (148). As noted below, almost two-thirds of 15- to 19-year-old U.S. females giving birth in 1988 said that their pregnancies were unintended (59a); combined with the high rate of abortions among pregnant

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[23] Title X of the Public Health Service Act is discussed in the section of this chapter on Federal programs and policies related to adolescent pregnancy and childbearing.

[24] This research is summarized in table 10-8 in the section of this chapter on contraceptive provision programs below.

U.S. adolescents, this observation suggests that most pregnancies among U.S. adolescents are unintended.

Adolescents who are unmarried are more likely to have an abortion than those who are married (13,80,232); and pregnant adolescents who are achieving academically before pregnancy and who have a strong future orientation are more likely to choose abortion to resolve an unintended pregnancy than those who are not doing well in school and lack high educational and vocational goals (148). Another attitudinal factor that has consistently been found to discriminate between abortion and term pregnancy groups is attitude toward abortion, with those choosing to terminate their pregnancy expressing greater acceptance of abortion (53,114).

As noted earlier, pregnant adolescents are at risk for a variety of *pregnancy and birth* complications (75a,134,137,189). Furthermore, babies born to adolescent mothers are more likely to be premature or low birthweight and are more likely to require hospitalization within the first 5 years of life than babies born to women over age 19 (71b,84,190,196). But as noted above, except in the case of the very youngest adolescents, pregnancy and birth complications are probably not related to low maternal age per se (63a). Some adolescents enter pregnancy with preexisting conditions such as anemia or substance abuse problems that may cause adverse outcomes. Adolescents who use illicit drugs are at high risk for experiencing poor pregnancy outcomes such as low birthweight (under 2,500 grams) and infant mortality (223b), and heavy alcohol use is believed to be a risk factor for long-term damage to children (188a).[25] Other preexisting conditions that may cause problems include poor nutrition and anemia.[26] Teenagers seem to be at especially high risk of nutritional deprivation during pregnancy (148).

Many of the physical health risks to adolescent mothers and their babies can be significantly reduced with proper prenatal care and good nutrition (14).[27] The standards of the American College of Obstetricians and Gynecologists, and the American Academy of Pediatrics recommend that every pregnant woman have a comprehensive program of prenatal care beginning as early in the first trimester of pregnancy as possible (9a,148). Furthermore, a 1988 OTA study concluded that available evidence supports the value of both early and frequent prenatal care and the provision of enhanced services to adolescents.[28]

Unfortunately, many pregnant adolescents in this country—53 percent of pregnant 15- to 19-year-olds in 1988 (207b)—do not receive prenatal care ever or until after the first trimester of their pregnancy (204,207b). The problem of late or no prenatal care is caused by numerous factors, ranging from adolescents' failure to recognize the early signs of pregnancy to concerns about costs or confidentiality (148). Unmarried teenagers with less than a high school education have been found to be among the least likely to receive first-trimester prenatal care (96a,148,185a,199). The problems associated with late or no prenatal care are exacerbated among pregnant adolescents who have not been educated about nutrition or who have poor health habits (6,127).

Adolescents who choose to carry their pregnancies to term also need adequate care for labor and delivery.[29] Maternity care is often expensive, and some adolescents may experience problems related to financial access.

Following delivery, the immediate needs of adolescent mothers and their babies (e.g., food, housing, health care, economic support, social support, child care) are numerous (148). Individual adolescents vary in their ability to have these needs met, and some adolescents (e.g., those who are very young, those who have poor parenting or life planning skills, those with substance abuse problems) may have greater difficulty than others. Many adolescent parents require extensive social and economic support. A 1990 review by the Congressional Budget Office (CBO) found that few adolescent mothers are able to support themselves and their children during the first few years of parenthood (195).[30] According to CBO's analysis, the amount of support available to *married* adolescent mothers varies, depending on their husbands' age, educational level, and employment status; however, 40 percent of married adolescent fathers were found to be high school dropouts, and adolescent fathers were less likely than fathers age 20 and over to have jobs (195a). Almost no information is available on support for adolescent mothers and their children from the absent fathers of those children.

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[25] See ch. 12, "Alcohol, Tobacco, and Drug Abuse: Prevention and Services," in this volume. As noted in that chapter, alcohol is the most frequently used drug among adolescents. The extent to which adolescent females drink heavily during pregnancy is unknown, however.

[26] See ch. 7, "Nutrition and Fitness Problems: Prevention and Services," in this volume.

[27] *Prenatal care* refers to medical services delivered from conception to labor (199). Such care encompasses a wide range of preventive, diagnostic, and therapeutic services delivered throughout the course of pregnancy with the goal of a healthy baby and a healthy mother (199).

[28] See OTA's 1988 report *Healthy Children: Investing in the Future* (199).

[29] *Maternity care* includes prenatal care and intrapartum care (labor and delivery care) (199).

Familial Factors Related to Pregnancy Outcomes—According to the 1987 National Academy of Sciences' report, several studies of adolescent girls who choose *abortion* have found that family background factors are significant predictors (148). Adolescent females from white families are more likely than those from black families to terminate an unintended pregnancy, and females from families with higher socioeconomic status are more likely to have abortions than those from families living in poverty.

Some studies have found that parental attitudes, especially mothers' attitudes toward abortion, predict adolescent daughters' pregnancy termination decisions (50a,148). Particularly among young adolescents, parents seem to play a major role in the decision to terminate an unintended pregnancy (173).[31] There is some evidence of a link between being raised in a single-parent home and early *childbearing* (25a,92). Some studies have found that adolescents who become pregnant and have an abortion are more likely to come from two-parent families with smaller numbers of children than adolescents who carry their pregnancies to term (37,63).

Studies that have examined the role of families in helping adolescent mothers adjust to *parenting roles* are scarce, and studies of the families of adolescent fathers are virtually nonexistent (148).

In its analysis of Current Population Survey data, CBO found that more than half of young unmarried mothers lived with their parents or other relatives (195a). CBO noted that by sharing living quarters with parents and other relatives, young single mothers were probably able to benefit from the overall household income and other supports in the household (195a). A relatively low 34 percent of unmarried mothers who lived with relatives lived in poverty (based on the cash income of the extended family unit); available data also suggested that adolescent mothers living with relatives were also more likely to be able to continue their schooling (195a).

Social/Environmental Factors Related to Pregnancy Outcomes—The incidence of *abortion* has increased since the U.S. Supreme Court's *Roe v. Wade* decision in 1973 [410 U.S. 113 (1973)]. As discussed later in this chapter, however, some adolescents' access to abortion is limited by factors such as cost, geographic distance from facilities that perform abortions, and parental consent and notification requirements.[32] According to the National Academy of Sciences' report, one study found that adolescent females' decisions about whether or not to carry their pregnancies to term were predicted by the attitudes of both their female friends and their male partners, and adolescent females who have friends who are themselves adolescent parents are more likely to carry their pregnancies to term than those who do not have friends who are parents (50a,148).

Pregnant adolescents who receive early and regular prenatal care that is appropriate to their level of risk are more likely to have healthy *birth* outcomes than those who do not, but gaining access to prenatal and perinatal services seems to be a problem for many adolescents. As noted above, about half of pregnant 15- to 19-year-olds in 1988 did not receive prenatal care in the first trimester of pregnancy (207b). One of the factors influencing adolescents' (and other women's) use of prenatal and other maternity care is the availability of a payment source.[33] Because of a loophole in the regulations issued under the Pregnancy Discrimination Act of 1978 (Public Law 95-555), almost one-third of privately insured adolescents are not covered for maternity-related services by their parents' employment based health plans.[34] Pregnant adolescents without private health insurance who rely on Medicaid and other Federal and maternal and child health programs to pay for their maternity care may also experience access problems.[35]

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[30] Various sources of support, including Aid to Families With Dependent Children (AFDC), are discussed below.

[31] For further discussion of the role parents play in adolescents' health care decisions, see ch. 3, "Parents and Families' Influence on Adolescent Health," in this volume, and ch. 17, "Consent and Confidentiality in Adolescent Health Care Decisionmaking," in Vol. III.

[32] Adolescents' access to abortion is discussed in the section of this chapter below entitled "Programs That Offer Alternatives to Parenthood."

[33] See ch. 16, "Financial Access to Health Services," in Vol. III. Also see OTA's 1988 report *Healthy Children: Investing in the Future* (199).

As noted earlier, few adolescent mothers are able to support themselves and their children during the first few years of parenthood (195a). Other sources of economic and social support, therefore, can have a great impact on outcomes for adolescents who bear and keep their children (128,148). AFDC benefits are an alternative source of economic support for unmarried (and some married) adolescent mothers. CBO's analysis of NLSY data found that about half of all adolescent mothers received AFDC benefits sometime during the 5 years after they first gave birth, but that most were not covered by AFDC for at least some time during those 5 years (195a).[36]

Overall, CBO found high levels of poverty among adolescent mothers, particularly those who were unmarried (195a). Almost half of all adolescent mothers, and 81 percent of unmarried mothers living with only their children, had family cash incomes below the poverty line in 1985 and 1986 (195a). Based on the level of poverty among adolescent mothers and an analysis of available sources of support, CBO concluded that many of the economic problems of adolescent parenthood could be eased if young mothers had more resources available to support their families (195a). Improvements discussed by CBO included programs to improve the mothers' earning ability, programs to raise the amount of support provided by young fathers or other relatives, and programs to expand the benefits offered by Federal and State governments (195a).

Demographic Differences Related to Adolescent Pregnancy and Pregnancy Outcomes

As noted elsewhere in this Report, in 1988, more than 8 million (26.7 percent) of the country's 31 million adolescents lived in a poor or near-poor family.[37] Poor and near-poor are terms defined in relation to the Federal poverty level, a cash income level which varies with family size and the age of family members. Poor families are those with incomes below the Federal poverty level, and near-poor families are those with incomes between 100 and 149 percent of the Federal poverty level.

The health and other effects of growing up poor are complex and not well understood, but because poverty is often associated with a low educational level, substandard living conditions, an inadequate social support network, poor nutrition, unemployment, and diminished access to health care, children growing up in poor or near-poor families probably confront more risk factors and benefit from fewer protective factors than their more advantaged peers.

Children and adolescents living in single-parent households headed by a female are disproportionately poor. In 1988, nearly two-thirds of U.S. adolescents who lived with their mothers only lived in poor or near-poor families. U.S. adolescents from racial and ethnic minority groups are also disproportionately poor. In 1988, about half of black, non-Hispanic adolescents, half of Hispanic adolescents, half of American Indian and Alaska Native adolescents lived in poor or near-poor families.[38] Among white, non-Hispanic U.S. adolescents, less than one-fifth lived in poor or near-poor families.

As discussed elsewhere in this Report, data and research on the health status of poor adolescents and on the health effects of poverty have major limitations. How adolescents' social class and race/ethnicity are related to pregnancy-related behaviors such as the initiation of sexual activity and contraceptive use, to pregnancy, or to pregnancy outcomes such as abortion, childbearing, or parenting is not entirely clear. Studies showing differences between adolescents of different socioeconomic statuses or racial or ethnic backgrounds are discussed below. Many of these studies differ among themselves, depending on factors such as the following:

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[34] For further discussion, see the section of this chapter below entitled, "Programs Designed To Prevent Negative Outcomes of Adolescent Pregnancy and Parenting," and ch. 16, "Financial Access to Health Services," in Vol. III.

[35] For further discussion, see the section of this chapter below entitled "Major Federal Programs and Policies Pertaining to Adolescent Pregnancy and Parenting," and ch. 16, "Financial Access to Health Services," in Vol. III.

[36] CBO found that nearly 40 percent of recipients who were *not* married when their children were born left the AFDC program within 1 year and more than 70 percent left within 4 years, as compared with about 70 percent and 90 percent, respectively, of their married counterparts (195a).

[37] See ch. 18, "Issues in the Delivery of Health and Related Services to Selected Groups of Adolescents," in Vol. III.

[38] See ch. 18, "Issues in the Delivery of Health and Related Services to Selected Groups of Adolescents," in Vol. III for further discussion.

- the behavior or outcome that is investigated (e.g., sexual activity v. contraceptive use v. childbearing);
- the specific races and/or ethnic backgrounds that are compared;
- the measure of socioeconomic status that is used (e.g., various measures of the socioeconomic status of the family of origin, various measures of socioeconomic status of the impregnating male, the adolescent's anticipated social class, education levels, job categories[39]); and,
- perhaps most importantly, the number and types of factors that are simultaneously investigated, and subsequently statistically controlled, in the study.[40] [41]

In addition, it should be understood that studies finding differences by race/ethnicity or socioeconomic status have to be interpreted sensitively. While such findings can be used to target specific groups of adolescents for services, they may not be helpful in determining the precise causes of adolescent pregnancy or variations in pregnancy-related outcomes in specific groups or in individual adolescents. These determinations typically require further study.[42]

Socioeconomic Differences Related to Pregnancy and Pregnancy Outcomes—Available data discussed below suggest that adolescents from socioeconomically disadvantaged families are at greater risk of nonmarital pregnancy and parenting than adolescents from nondisadvantaged families. In comparison to their more advantaged peers, these adolescents tend to initiate sexual activity at an earlier age, are less likely to use contraceptives when sexually active, are less likely to have an abortion, and are more likely to give birth to children out of wedlock. They also seem to be less likely to give their babies up for adoption.

Socioeconomic Differences Related to Pregnancy—Data from the NLSY indicate a relationship between adolescents' mothers' level of schooling, which is one measure of socioeconomic status, and the age at which adolescents initiate *sexual activity* (148). The 1982 NLSY included a sample of 4,657 males and 4,648 females who were age 20 and over at the survey date. Among male adolescents whose mothers had some education beyond high school, 56 percent engaged in sexual intercourse before age 18, in comparison with 72 percent of male adolescents whose mothers did not complete high school. Among female adolescents whose mothers had some education beyond high school, 34 percent became sexually active before age 18, in comparison with 54 percent of female adolescents whose mothers did not complete high school (148).

Other investigators have found that adolescents' *anticipated* social class (as measured by their educational aspirations) has a greater effect on the initiation of sexual activity than does their current socioeconomic status. Adolescents who expect to complete more years of schooling are more likely to delay the initiation of sexual intercourse than adolescents who expect to complete fewer years of school (135a). And, not surprisingly, other investigators have found that the social class of the family of origin *and* the adolescent's anticipated social class both influence the initiation of sexual activity (139,144,183,192,234). However, parental expectations of an adolescent's sexual behavior have also been found to have an independent influence (52a).

Studies that have investigated the relationship between socioeconomic status of the adolescent's family of origin and the *use of contraceptives* have found results similar to those for initiation of sexual intercourse: adolescents from socioeconomically disadvantaged families are less likely to use contraceptives than those from those from nondisadvantaged families (152). Adolescents' socioeconomic status has not been found to have as much impact on adolescents' contraceptive use as adolescents' age at the time of initiation of sexual activity, adolescents' attitudes about contraception, pregnancy, abortion, education, frequency of intercourse, and some of the other individual factors discussed earlier (85). However, the influence of an adolescent's socioeconomic status may be felt in terms of access to contraceptives and the availability of contraceptives (97a).[43]

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[39] These measures are themselves often highly intercorrelated.

[40] For example, if a study only collects data on the race, but not the socioeconomic status, of adolescents in the sample, it will not be able to distinguish outcomes by social class from outcomes by race.

[41] In some studies, socioeconomic status and race/ethnicity appear to affect pregnancy-related behaviors and outcomes independently, but closer inspection sometimes reveals a multiplier effect of economic disadvantage (e.g., 140). Some observers believe that attempts to control for socioeconomic differences when comparing black and white adolescents have been inadequate, as they do not account for the time spent in poverty and disparity between blacks and whites in categories of socioeconomic status (148).

[42] For further discussion, see ch. 18, "Issues in the Delivery of Services to Selected Groups of Adolescents," in Vol. III.

Socioeconomic differences in rates of sexual activity and in the use of contraceptives would lead naturally to findings that adolescents of lower socioeconomic status are also more likely to become *pregnant*. To OTA's knowledge, there is little information directly on this point. Information on pregnancies and pregnancy rates by adolescents' socioeconomic status is not readily available. In an analysis of 1979 data from the NLSY, however, Mott and Haurin found that the lower the family income of female adolescents and the less the mother's education, the more likely an adolescent was to report a first pregnancy prior to age 16 (144b).

Socioeconomic Differences Related to Pregnancy Outcomes—As noted earlier, the major Federal report on health indicators in the United States—*Health United States*—does not tabulate data on *birth rates* by income or other factors indicative of socioeconomic status. There is some evidence that pregnant adolescents of lower socioeconomic status—as measured by family income (61) and other factors—are more likely to carry their pregnancies to term than other adolescents of higher socioeconomic status, regardless of their race (86a). One hypothesis to explain apparent social class differences in childbearing is that having babies is a rational response to poverty for poor adolescents, in that by having children poor adolescents may gain access to family networks and support programs that otherwise may not be available to them. Several studies have suggested that childbearing may mobilize supportive responses from family, peers, and others (e.g., social programs, including mentoring or educational programs) (19,72,122).[44] Another hypothesis might be that adolescents from low-income families have less access to abortions than other adolescents.

A number of researchers have found that poverty and poor employment opportunities are closely associated with *out-of-wedlock births* (148). The 1988 National Survey on Family Growth found that among U.S. females, females ages 15 to 19 and females with family incomes below the Federal poverty level had the highest rates of unintended births (59a).[45] Reports from this survey did not combine the factors of age and socioeconomic status to give an estimate of childbearing by socioeconomic status for adolescents (59a). In the 1988 National Survey of Family Growth, 72.6 percent of the 15- to 19-year-old females who gave birth between 1984 and 1988 and 60 percent of females with incomes under the poverty level reported that their pregnancies were unintended (59a).[46]

Some observers have also expressed concern that the conditioning of social benefits on the presence of children in the family may encourage poor people to have children. The largest cash assistance program serving poor families with children is the AFDC program administered by the Family Support Administration in DHHS.[47] For the first 25 years of AFDC, if a father lost his job and his family became needy, State AFDC programs were forbidden to help the family so long as the father lived at home (195d). (In 1961, in an antirecession measure, the law was changed so that families with jobless fathers at home *could* qualify for AFDC at a State's option (195d).) This arrangement has been believed by some to have encouraged out-of-wedlock childbearing and single-parent households.[48] Some evidence suggests, however, that birth rates are not related to potential receipt of welfare benefits; real reductions in the level of welfare benefits since the mid-1970s have not resulted in decreases in single-parent families, nor is single-parenthood related to differences in levels of welfare benefits across States (14a).

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[43] Various programs intended to increase low-income adolescents' access to contraceptives are discussed later in this chapter.

[44] Adolescents from families of higher socioeconomic status may also bear children in order to receive support and attention from family and friends.

[45] *Unintended births* are a combination of births resulting from pregnancies that are "mistimed" and "unwanted" (59a).

[46] Among females of all ages who gave birth in the period 1984 to 1988, the percentage of births that were unintended decreased with increasing income level. Almost 60 percent of births to females with incomes under 100 percent of the Federal poverty level were unintended, as compared to 42.7 percent of births among women with incomes between 100 and 199 percent of the poverty level, and 31.8 percent among women with incomes over 200 percent of the poverty level.

[47] AFDC and various other Federal programs of relevance or potential relevance to poor adolescents are described at greater length in ch. 18, "Issues in the Delivery of Services to Selected Groups of Adolescents," in Vol. III. For a further discussion of Medicaid, also see ch. 16, "Financial Access to Health Services," in Vol. III.

[48] A recent welfare reform law, the Family Support Act of 1988 (Public Law 100-485), altered this arrangement by requiring that all States that operate AFDC programs provide AFDC to two-parent families who are needy because of the unemployment of the principal wageearner—the so-called AFDC-UP (Unemployed Parent) provision (195d). The unemployed parent must meet certain requirements pertaining to previous employment and is required to search for a job or participate in the Job Opportunities and Basic Skills (JOBS) program (195d), but, overall, this provision does provide greater support for the possibility of a father living with an adolescent mother and their child(ren). It is too early to be able to assess the effects, if any, of changes in social welfare program eligibility requirements on rates of out-of-wedlock childbearing among adolescents. For further discussion of AFDC and the JOBS program, see the section on Federal policies and programs related to adolescent pregnancy and parenting below.

Data on the number of abortions or abortion rates by adolescents' socioeconomic status are not available. Some observers believe that socioeconomically disadvantaged adolescents who become pregnant are *less* likely to have an *abortion* than their more advantaged peers, as they may have problems of access (especially financial) to abortions (13,232). Federal funding for abortion as a method of family planning has statutorily been prohibited for several years.[49]

The few studies that have been conducted on *adoption* among adolescents indicate that adolescents who make adoption plans tend to be of higher socioeconomic status (171a). A recent study on the characteristics of adolescents who choose to give their child up for adoption indicate differences between adolescents of different social classes: adolescents from families of higher socioeconomic status are more likely to choose to put their child up for adoption than adolescents from disadvantaged families. In addition, adolescents who have higher educational aspirations, which has been linked to social class, are more likely to put their child up for adoption (19a).

Racial Differences Related to Pregnancy and Pregnancy Outcomes—As discussed further below, there are large racial differences in patterns of sexual activity, contraceptive use, birth rates, and out-of-wedlock childbearing rates. According to the National Academy of Sciences' comprehensive 1987 report on adolescent pregnancy and childbearing, what accounts for these differences is not at all clear (148). Some observers attribute the racial differences wholly or in part to socioeconomic differences among blacks and whites; others maintain that the differences are primarily attributable to differences in the acceptability of early nonmarital sexual activity, pregnancy, and parenthood. Research has not yet resolved this controversy (148).

Racial Differences Related to Pregnancy—Available data indicate that black adolescents in this country tend to *initiate sexual activity* at earlier ages than white adolescents and that the proportion of black U.S. adolescents who are sexually experienced is greater than the proportion of white U.S. adolescents who are sexually experienced at every age of adolescence (16a,59a,86a,151,152,235). National data from 1984 and 1988 show that among U.S. adolescents who have had sexual intercourse, black males initiated intercourse 2 years earlier than whites and black females initiated intercourse 1 year earlier than whites (129,187). The 1988 National Survey of Family Growth found that the percentage of 15- to 19-year-old black, non-Hispanic females who had ever had sexual intercourse was 60.8 percent (59a), somewhat higher than the percentage of 15- to 19-year-old white non-Hispanic females who had ever had sexual intercourse (52.4 percent).

The National Survey of Adolescent Males found that 19.8 percent of black non-Hispanic adolescent males surveyed reported that they had had their first sexual intercourse by age 12 or under, an average of 2 years younger than white non-Hispanic and Hispanic males (187). Almost half (47.8 percent) of the black non-Hispanic males in this survey reported having had their first sexual intercourse by age 14 (187). These data should be viewed with some caution because the question about age of first sexual intercourse was asked of males who were already ages 15 to 18; however, the results are consistent with other findings about the early initiation of sexual intercourse among black children and adolescents of both sexes. In addition, black non-Hispanic males reported having had more sexual partners in their lifetimes than did white non-Hispanic and Hispanic males (187).[50]

Researchers disagree on the reasons for racial differences in the timing of the initiation of sexual intercourse and proportion of sexually active adolescents (148). There is some evidence that black females mature at earlier ages than white females (43,75b), but the physical differences between black and white females are too small to account for the greater differences in age of initiation of sexual activity (139a,148). Furthermore, in the case of white females, the effect of biological factors on the initiation of sexual activity seems to be strongly mediated by factors in the individual's social environment (148). Some studies have found that neighborhood environments are very important in influencing adolescents' decisions to initiate sexual behavior (9c,148). Several studies suggest that when comparisons are made among adolescents of similar socioeconomic status, there is no significant difference between the ages at which blacks and whites initiate sexual activity (35,68,144a,185). A few studies have found, however, that even after controlling for social class (148) and mother's level of education (86a), racial differences still exist between blacks and whites in the age of first intercourse.[51]

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[49] Federal regulations issued by DHHS in 1988 also prohibit abortion counseling and referrals by family planning clinics receiving funds under Title X of the Public Health Service Act. For further discussion of Federal policies related to abortion, see the section below on Federal policies and programs related to adolescent pregnancy and parenting.

[50] On average for ages 15 to 19 taken together, black non-Hispanic males reported having had an average of 8.3 sexual partners, compared to 4.29 partners for white non-Hispanic males and 5.15 partners for Hispanic males (187). The measure of variability (i.e., the range in the number of partners across surveyed males) was greatest for black non-Hispanic males (standard deviation of 18.62 for 15- to 19-year-olds), second greatest for Hispanic males (standard deviation of 12.13 for 15- to 19-year-olds), and lowest for white non-Hispanic males (standard deviation of 6.71 for 15- to 19-year-olds) (187).

Overall, most of the available research indicates that black adolescent females are less likely to *use contraception* than white adolescents. Given that black adolescents are more likely to initiate sexual activity at an early age and that young adolescents are less likely to use contraception than older ones, this general finding is not unexpected. It is important to note, however, that one investigator found that in the majority of the research on contraceptive use, blacks are inadequately represented and race is confounded with socioeconomic status (142).

The 1988 National Survey of Family Growth found that the percentage of black non-Hispanic females ages 15 to 19 who used some contraception at first intercourse (one, but not the only, indicator of contraceptive use) was 54.1 percent, an increase from 35.8 percent in 1982 but somewhat lower than the percentage of white non-Hispanic adolescents who used some form of contraceptive at first intercourse (69 percent) (59a). If one controls for socioeconomic status when comparing contraceptive practices at first intercourse, one finds that blacks more often use a prescription method of contraception (e.g., the pill, a diaphragm) than their white counterparts (234). Zelnik and Shah found that among adolescents who used contraception at first intercourse, 41 percent of black adolescents used a prescription method of contraception, as compared with 15 percent of white adolescents (234). Definitive calculations of prescription contraceptive use are not available from the National Survey of Family Growth, but National Survey of Family Growth data do indicate that 15.7 percent of black, non-Hispanic females, as compared with 7.1 percent of white, non-Hispanic females, used the pill at first intercourse (59a).

Among U.S. adolescents who do not use contraception at first intercourse (if one does not take socioeconomic status into account), black adolescents have been found to take longer to begin using contraception than white adolescents (85). In the recent National Survey of Adolescent Males, however, black non-Hispanic males generally reported *greater* use of contraceptives at their last intercourse before the survey (one measure of current contraceptive use) than did white non-Hispanic or Hispanic males (186b).[52]

Several studies indicate that examinations of differences in contraceptive use must examine factors other than race. Two studies found that black adolescents whose parents had high levels of education used contraception more regularly than black adolescents whose parents were less educated (38,235). Another study looked at how black females perceived opportunities in nonreproductive roles; those with better perceived opportunities were more likely to be regular contraceptive users (146a).

National data on pregnancy rates among black adolescents are not available, but the numbers of births and abortions in the black adolescent population[53] (see below) suggest that *pregnancy rates* among black adolescents are substantially higher than pregnancy rates among white adolescents (52a,214). In 1987, the estimated pregnancy rate for white 15- to 19-year-olds was 90 pregnancies per 1,000 population; for "nonwhite" adolescents (including black, Asian, and other adolescents) in the same age group, the rate was 189 pregnancies per 1,000, more than twice the rate for white adolescents (8a).

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[51] Some observers have argued that efforts to control for social class in some studies are inadequate (e.g., because they do not account for the amount of time spent in poverty and other factors) (148).

[52] This finding was true overall and for the use of ''condoms alone or with other methods,'' the latter of which was reported by 65.5 percent of black non-Hispanic males ages 15 to 19 combined, compared to 54.4 percent of white non-Hispanic males, and 53.0 percent of Hispanic males in that age group (186b). Black male 15- to 19-year-olds, however, reported somewhat less use of an ''effective female method [e.g., oral contraceptives, diaphragm, intrauterine device, sponge) without a condom'' (14.5 percent) than did white non-Hispanic (22.2 percent) or Hispanic (15.6 percent) male 15- to 19-year-olds in this survey (186b). Only 20 percent of black 15- to 19-year-old males reported the use of ineffective or no contraceptive methods at last intercourse (186b).

[53] As noted earlier, the numbers of births and abortions along with miscarriages and stillbirths, are used to estimate the number of pregnancies and pregnancy rates in a given population.

What accounts for the higher rates of pregnancy among black adolescents is not entirely clear. One survey of pregnant adolescents found that 70 percent of the blacks surveyed expected a favorable reaction about their pregnancy from their peers and 65 percent expected that they would get a favorable reaction from the father of their child; only 40 percent and 43 percent of whites, respectively, felt that they would receive favorable reactions (148). A number of studies reveal that black adolescents prefer earlier age for first birth than marriage, while white adolescents prefer earlier age for marriage than for first birth (148,224a). The degree to which differences in values and attitudes affect differences in sexual activity is questionable, as often such attitudes are measured after sexual experience, and thus the attitudes expressed may be a reflection of this experience (86a). In addition, the impact of socioeconomic and subcultural differences in attitudes is not clear from this body of research.

One recent study of 1,590 inner city females ages 13 to 18 who used health clinics, most of whom were black and from single-parent low socioeconomic status homes, found that sexually active females came from more psychosocially disadvantaged backgrounds than their sexually inactive peers (187a). The females who became pregnant were from significantly less stable homes than either the never-pregnant but sexually active females or the sexually inactive females.

Racial Differences Related to Pregnancy Outcomes—Black adolescent females in the United States have dramatically higher *birth rates* than adolescent females of all races or white adolescent females. In 1988, as noted earlier, the birth rates among U.S. females were under age 20 were as follows:

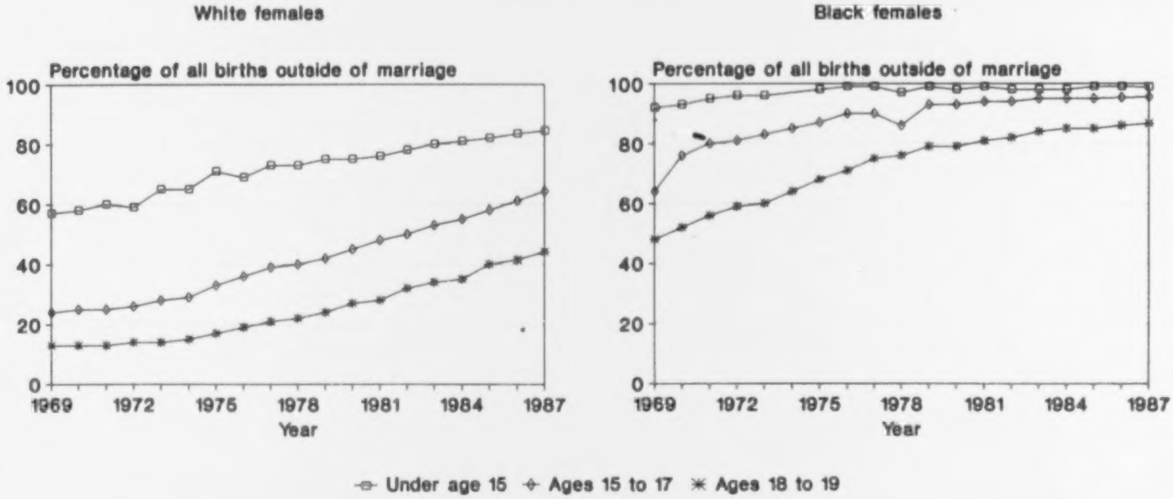
- *10- to 14-year-olds*: all races, 1.3 births per 1,000 females, with whites at 0.6 births per 1,000 and blacks at 4.8 births per 1,000;
- *15- to 17-year-olds*: all races, 33.8 births per 1,000 females, with whites at 25.5 births per 1,000 and blacks at 76.6 births per 1,000; and
- *18- to 19-year-olds:* all races, 81.7 births per 1,000 females, with whites at 69.2 births per 1,000 and blacks at 150.5 births per 1,000 (202f).

During the 1970s and early 1980s, there was a substantial decline in birth rates among black U.S. females under age 20 (202f). By 1984, birth rates among black U.S. females had dropped to 4.3 births per 1,000 10- to 14-year-olds, to 69.7 births per 1,000 15- to 17-year-olds, and to 132 births per 1,000 18- to 19-year-olds (202f). Since 1984, however, birth rates among black U.S. adolescent females have been steadily increasing (202f). In fact, birth rates among black U.S. adolescents in 1988 were at their highest levels in about a decade (202f). The reasons are not clear.

Differences in *out-of-wedlock childbearing* among black and white U.S. females under age 20 have also been narrowing in recent years, but they are still striking (see figure 10-11). Very few births to black adolescents are to adolescents who are married. The reasons are unclear, although various explanations have been offered. The shortage of black males able to provide sufficient economic support to a family (e.g., because of unemployment and economic disadvantage) may partially account for the high rates of out-of-wedlock births among poor black adolescents (148). Furthermore, black adolescents are significantly more likely than whites to live in low-income communities in which rates of unemployment are high and poor, mother-headed families have been prevalent for generations (148). When asked, blacks in these communities report a greater tolerance for sexual activity outside a marriage and a greater tolerance for nonmarital childbearing (148). Whether these attitudes reflect deepseated subgroup values or are transient responses to economic circumstances is not known (148). Some observers believe that differences in attitudes are affected by the differential economic histories of the races, in that chronic economic disadvantage affects attitudes toward marriage and family (1,140).

Data on 1985 abortion rates for whites and "nonwhites" (a group that includes blacks, Asians, and other groups) are available from the Alan Guttmacher Institute. These data indicate that 1985 abortion rates among females under age 15 were 5.0 abortions per 1,000 population for whites and 27.0 abortions per 1,000 population for nonwhites; for

Figure 10-11—Trends in Out-of-Wedlock Childbearing Among U.S. Females Under Age 20 by Race, 1969-87



SOURCE: Office of Technology Assessment, 1991, based on U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Center for Health Statistics, Division of Vital Statistics, *Vital Statistics of the United States, Volume 1: Natality* (Washington, DC: U.S. Government Printing Office, various years).

females ages 15 to 19, the rates were 71.1 abortions per 1,000 population for whites and 127 abortions per 1,000 population for nonwhites; for females ages 18 to 19, the rates were 55.4 abortions per 1,000 for whites and 97.1 abortions per 1,000 for nonwhites (81a).

Data from the National Center for Health Statistics in DHHS suggest that black adolescent females who become pregnant are slightly less likely to have an abortion than their white peers are (148). In 1983, 40.5 percent of pregnancies of white adolescents and 38.1 percent of pregnancies of black adolescents ended in abortion (148). Because rates of unintended pregnancies are higher among black adolescents than among white adolescents, however, black adolescents have much higher population-based abortion rates than white adolescents (148).

As noted earlier there is no national system for collecting information about U.S. females who carry their pregnancies to term and give their babies up for *adoption* (148). Thus, national information concerning black adolescents who give their babies up for adoption is not available. A study in 1982 estimated that 93 percent of unmarried black mothers ages 15 to 19 kept and raised their children (12,148). In some cases, grandmothers, other relatives, or friends assumed responsibility for a child's care (12).

Ethnic Differences Related to Pregnancy and Pregnancy Outcomes—Data on adolescents of *Hispanic* origin typically includes both black and white Hispanics. According to the report by National Academy of Sciences' Panel on Adolescent Pregnancy and Childbearing, national data describing ethnicity began to be available only in the 1970s, as some subgroups—especially Hispanics—became more prominent minorities in this country (148).

Ethnic Differences Related to Pregnancy—Data on Hispanics are collected in recent surveys of sexual and fertility behavior, but the samples are often too small to permit disaggregation of the data by age (148). Thus, according to the National Academy of Sciences' Panel on Adolescent Pregnancy and Childbearing, information on Hispanic adolescents' sexual activity and fertility behavior is incomplete and not comparable to information for racial subgroups (148).

Some studies have found that Hispanic adolescents initiate *sexual intercourse* at roughly the same ages as non-Hispanic white adolescents (12a,141a,187). The 1988 National Survey of Family Growth found that 49 percent of 15- to 19-year-old Hispanic females said they had ever had sexual intercourse, slightly lower than the percentage of 15- to 19-year-old non-Hispanic white females (52.4 percent) who said they had had intercourse (59a). The percentage of 15- to 19-year-old Hispanic females who reported they had ever had sexual intercourse in 1988 was slightly lower than the percentage in 1982 (59a). The 1988 National Survey of Adolescent Males found that 19 percent of Hispanic males reported having had sexual intercourse by age 14 and 81 percent reported having had sexual intercourse by age 18 (187). These were similar to the percentages for white non-Hispanic males but far lower than those for black non-Hispanic males (187).

The 1983 NLSY, which interviewed a sample of 683 Hispanic males and 703 females who were age 20 and over at the survey date, found that 50 percent of the males and 24 percent of the females reported that they were sexually active by age 17; 67 percent of the males and 40 percent of the females reported that they were sexually active by age 18 (148). Although Hispanic adolescent females may be slightly less likely than non-Hispanic whites to be sexually active, they are considerably less likely to be using *contraception*. The 1988 National Survey of Family Growth found that the percentage of 15-to 19-year-old Hispanic females who used some form of contraception at first intercourse was 54 percent, while the percentage of white non-Hispanic adolescents who used some form of contraception at first intercourse was 69 percent (59a).

National data on *pregnancy rates* among Hispanic females are not available. In a 1982 study among unmarried Hispanic females ages 15 to 19, however, 15 percent reported having experienced a pregnancy (144). This percentage falls between that reported by unmarried, white non-Hispanic adolescents (8 percent) and that reported by same-age non-Hispanic blacks (23 percent).

Ethnic Differences Related to Pregnancy Outcomes—Data on ethnicity have been included in vital statistics reports published by the National Center for Health Statistics in DHHS only since 1978 (148). National natality statistics are somewhat limited because States do not always report the Hispanic origin of the parents on a child's birth certificate.[54] Further, many different nationalities and cultures are often subsumed under a single ethnic category (e.g., Hispanic), obscuring diversity within the category.[55] Data concerning *birth rates* among Hispanic adolescents are still somewhat incomplete and have only been collected during the past decade.

In 1980, the overall birth rate for Hispanic adolescents was about double the rate for non-Hispanic whites and about four-fifths the rate for non-Hispanic blacks (194). DHHS is unable to calculate population-based birth rates for Hispanic adolescents for the years 1980 to 1988 because truly national data on Hispanic births are not currently available (207b). However, DHHS estimated that in 1988 about 1 in 6 Hispanic-origin births was to a teenage mother in 1988, as compared with 1 in 10 white births and 1 in 5 black births (table 10-1) (207b).[56] In the States for which data were available in 1988, there were 73,858 births to Hispanic females under age 20 (207b). According to DHHS, the incidence of adolescent childbearing among the various Hispanic groups varies widely: in 1988, 17 percent of Mexican births and 21 percent of Puerto Rican births, as compared with 6 to 8 percent of Cuban and Central and South American births, were births to adolescent mothers (207b).

Data collected since 1980 suggest that there has been an increase in the percentage of births that are *out-of-wedlock births* among Hispanic adolescents ages 15 to 19, from 43 percent of births to these adolescents in 1980 to 52 percent in 1985 (1a). In 1986, 55 percent of births to Hispanic adolescents were *out-of-wedlock* as compared with 46 percent of births to white adolescents and 91 percent of births to black adolescents (205).

National data on Hispanic adolescent mothers who have *abortions* or who carry their pregnancies to term and give their children up for *adoption* are not available (148). In 1985, a tabulation by the Alan Guttmacher Institute of national survey data of abortion patients indicated that 50 per 1,000 Hispanic adolescent females ages 15 to 19 had abortions, as compared with 38 per 1,000 non-Hispanic whites and 53 per 1,000 nonwhites (8).

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[54] In 1988, 30 States and the District of Columbia reported the Hispanic origin of the parents on the birth certificate; this was an increase of 7 States over the number reporting this information during the years 1983 to 1987 (207b). According to 1980 census data, however, these 30 States contained 95 percent of the Hispanic-origin population (207b).

[55] The National Center for Health Statistics' 1988 report on natality statistics did report national origin (e.g., Mexican, Puerto Rican, Cuban, Central and South American) of Hispanic mothers, as available from the States that reported information on parents' Hispanic origin (207b). However, these data were not further disaggregated by mother's age.

[56] Hispanic and non-Hispanics are included in these estimates for whites and blacks (207b).

According to DHHS, the number of births to *Asian and Pacific Islander* adolescents in 1988 was 8,056 (207b). The lowest numbers of births to Asian and Pacific Islander adolescents were to Chinese and Japanese adolescents (243 and 295 births respectively). DHHS reported that there were 1,181 births to Hawaiian adolescents, 1,527 to Filipino adolescents, and 4,810 to "other" Asian and Pacific Islander adolescents. It is not possible to calculate accurate current pregnancy or birth rates for Asian adolescents (212).

The number of births (8,455) to *American Indian and Alaska Native* adolescents in 1988 was quite high in proportion to such adolescents' representation in the population (207b). Estimates of the American Indian and Alaska Native population are difficult to make, but if, as OTA estimates, there are approximately 100,000 American Indian and Alaska Native females ages 15 to 19 (199a), the birth rate for this group would be 83 births per 1,000 population—about 1.5 times that of all U.S. adolescents ages 15 to 19 combined, almost twice (1.9 times) the birth rate for white adolescents ages 15 to 19, and three-quarters the birth rate for black adolescents ages 15 to 19.

Prevention of Adolescent Pregnancy and Associated Negative Outcomes

Preventive programs related to adolescent pregnancy and parenting generally focus either on preventing the *occurrence* of adolescent pregnancy or on the provision of services designed to prevent possible *negative outcomes* of early pregnancy and childbearing. Both types of efforts and available data on their effectiveness are discussed below.

Programs That May Help Prevent Adolescent Pregnancy

Over the past 20 years, there has been dramatic growth in the number and variety of interventions aimed at preventing adolescent pregnancy (147a,148). According to Dryfoos, programs aimed at preventing adolescent pregnancy in this country are of three general types:

- those that seek to impart knowledge or influence adolescents' attitudes about sexual behavior, human relationships, reproduction, and contraception;
- those that seek to improve sexually active adolescents' access to contraceptives; and
- those that seek to enhance young people's life options by providing work opportunities or other alternatives to early pregnancy and childbearing (45,148).

The first two types of programs are the most common (45). These focus on increasing adolescents' *ability* to prevent a pregnancy, either by abstaining from sexual intercourse or by using effective contraceptive methods. The third type of program is intended to affect adolescents' *motivation* for avoiding early pregnancy and childbearing (45).[57] A recent addition to motivational programs are programs that pay adolescents who have been pregnant already to avoid repeat pregnancies (e.g., 101).

Few programs to prevent adolescent pregnancy have been rigorously evaluated in methodologically sound studies (28,47a). Producing scientific evidence about what works in preventing adolescent pregnancy requires measuring changes in adolescent pregnancy rates and attributing those changes to some program or curriculum (47a). Because of the difficulty of measuring pregnancies, surrogate measures (e.g., self-reports of sexual activity, knowledge and beliefs about sexual activity, birth rates) are often used. Questions have been raised about the reliability of self-report data; about the relationships between adolescents' knowledge, attitudes, intentions, and behavior; and about the validity of birth rates as an indicator of the effects of adolescent pregnancy prevention efforts.[58]

Even in programs where information on pregnancy rates *is* collected, observed reductions in the pregnancy rate may be due to factors other than the preventive intervention. Ruling out this possibility requires rigorous evaluation research. Rigorous evaluation research is costly, however, particularly when a longitudinal research design is required to determine long-term impacts on fertility behavior (88,149). Also, although experimental research can provide the most solid evidence of the impact of preventive interventions, there are often methodological or perceived ethical problems associated with creating control groups. For example, researchers may have problems deciding which adolescents should be given access to contraceptive education or health services. More frequently, methodological problems arise because prevention messages are delivered to groups that are hard to compare, or recipients of services are self-selected.

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[57] Some pregnancy prevention efforts combine aspects of these three general strategies. Thus, for example, programs that aim to prevent pregnancy by enhancing young people's life options are likely to include discussions of family life and sexuality as part of their efforts. Educational programs that seek to increase knowledge and influence attitudes may also attempt to affect adolescents' motivations to avoid sexual activity or pregnancy.

[58] Declines in teenage birth rates can be due to many factors unrelated to pregnancy prevention efforts. Sweden, for example, experienced a profound decline in teenage birth rates during the late 1970s and 1980s that was due largely to an increasing tendency of women to marry and have children later in life to be able to take advantage of wider educational and career options (74a). Declining birth rates can also be due to the increased use of abortion.

The paucity of systematic evaluations of the effectiveness of strategies for preventing adolescent pregnancy was noted in the 1987 report by the National Academy of Sciences' Panel on Adolescent Pregnancy and Childbearing (148,149). That report nevertheless concluded that there was adequate knowledge on which to base some recommendations (47a). The report stated that "because there is so little evidence for the effectiveness of the other strategies for prevention, the panel believes that the major strategy must be the encouragement of diligent contraceptive use by all sexually active teenagers" (47a,148). OTA's review suggests no reason to disagree with this recommendation, although it notes that the promotion of diligent contraceptive use by adolescents can be a complex task. The National Academy of Sciences also recommended pursuing the strategies of delaying the initiation of sexual intercourse among adolescents and enhancing "life options" for disadvantaged teenagers (47a,148). These strategies also seem justified by OTA's review of available literature, so long as the strategy of promoting effective contraceptive use among sexually active adolescents is not ignored.

Published information concerning the impact of programs that emphasize education, programs that provide contraceptives to adolescents, and programs to seek to develop adolescents' life options on pregnancy rates, sexual activity, or other outcomes is presented in the discussion that follows.

Programs That Emphasize Education

Education about human sexuality, once regarded as the responsibility of parents and guardians, is now commonly provided in junior and senior high school classrooms, as well as in some elementary schools (86). A study using retrospective data from the 1984 NLSY found that about 60 percent of the females and 52 percent of the males in the sample (all of whom were between the ages of 19 and 27 at the time of the survey) had taken a sex education course in school; the percentages were somewhat lower for blacks (57 percent for females and 49 percent for males) and Hispanics (50 percent for females and 46 percent for males) in the sample (129). A study using data from the 1982 National Survey of Family Growth found that 64 percent of the sample of females ages 15 to 19 had received school-based instruction about contraception (41).

According to Kirby, the content of sex education courses varies to some extent by grade level (107,148). High school courses typically cover a wider range of topics than courses at the junior high level. In junior high, many courses cover anatomy, physical and psychological changes of puberty, reproduction, dating, responsibilities in interpersonal relations, and STDs. Some junior high schools also cover contraceptive methods. High school sex education courses typically include topics covered in junior high plus teenage sexuality, pregnancy, and childbirth. About three-fourths of the high school courses cover family planning, contraceptive methods, and abortion.

Instruction in values as a part of sex education varies and is somewhat controversial (148). Some programs have emphasized enabling adolescents to make decisions about sexual matters in terms of their own values and beliefs. Other programs have used other approached such as teaching what are regarded as "basic universal values." Recently, many schools have begun teaching about sexuality in the broader context of family life education, which includes attention to the role and responsibilities of families and often emphasizes values (148).

The goals of school-based sex or family life education are not always clearly specified. Some courses are designed primarily to improve students' knowledge and understanding about how the body functions and about human sexuality (86). Some courses are also designed to help students understand the social context of sexuality, including relationships with others and the social, moral, and ethical restraints on its expression (86). Other goals may be to promote rational and informed decision-making about sexuality, to increase knowledge of reproduction to reduce sexual activity, or to reduce pregnancy (148). Most schools offer brief (10 hours or less) sex education programs that focus on the basics of anatomy, human reproduction, and physical and psychological changes during puberty; these are often integrated with other courses such as health or physical education, home economics, or biology (7,148). Very few schools offer comprehensive sex education programs of more than 40 hours (148), and Kirby estimates that less than 10 percent of all students take comprehensive sex education courses (107).

Information about the effects of school-based sex education/family life education courses on adolescents' knowledge, attitudes, sexual behavior, and pregnancy rates is presented below.[59] Also presented below is information on the effects of a variety of other programs that emphasize education:

- school-based decisionmaking, assertiveness, and life skills training programs that attempt to help adolescents make responsible decisions about sexual activity by teaching them problemsolving, decisionmaking, or interpersonal communications skills;[60]
- programs that emphasize communication between parents and their adolescent children for the purpose of encouraging young people to postpone sexual activity;
- community-based education efforts such as media campaigns that focus on imparting information about the negative consequences of early sexual activity, pregnancy, and parenting; and
- a multimodal pregnancy prevention program in that combined school- and community-based educational efforts with the provision of contraceptives through a school nurse.

School-Based Sex Education/Family Life Education—In 1988, researchers at the Alan Guttmacher Institute conducted a national survey of all State education agencies and 203 of the largest school districts in the United States (104). Forty-nine State education agencies plus the District of Columbia and 162 local school districts responded to the survey. Forty States plus the District of Columbia and the vast majority of the 162 responding school districts either required or encouraged some form of sex education in the schools (104).

Researchers at the Alan Guttmacher Institute found that the topics covered in sex education courses varied, as shown in table 10-4. About two-thirds of the States and four-fifths of the local school districts said they required or encouraged schools to teach about prevention of pregnancy (104). More States and local school districts said they required or encouraged AIDS education, STD education, or teaching abstinence from sex than said they required or encouraged teaching prevention of pregnancy (104). About four-fifths of the States and nine-tenths of the local school districts said they required or encouraged schools to teach abstinence. Abstinence from sexual intercourse is, of course, one means of preventing pregnancy. Some sex educators believe, however, that relying exclusively on abstinence as a means of preventing pregnancy and the transmission of STDs is unrealistic (74a). With American females now starting to menstruate on average at age $12^{1}/_{2}$ and many waiting longer to get married (74a), the period prior to marriage in which people are able to have and are interested in having sex is likely to be prolonged.

Evaluations of Sex Education Based on Data From National Surveys—As shown in table 10-5, evaluations of the effectiveness of sex education based on data from national surveys of young people have been performed by Zelnik and Kim, by Dawson, and by Marsiglio and Mott. Zelnik and Kim's study and Dawson's study found that expo-

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[59] These programs are known variously as sex education or family life education programs, with family life education apparently being the more current and encompassing term (181a). According to a recent review by the Southern Center on Adolescent Pregnancy Prevention, *family life education* is "a curriculum, program or framework for helping young people make responsible choices and decisions by providing accurate and age-appropriate information about human sexuality, and by exploring the attitudes, behaviors, and value systems that shape the development of healthy sexuality" (181a). According to the Center's review, "The demands and expectations of family life education today far exceed those of sex education in decades past. . .No longer just human anatomy and reproductive functioning, school-based [family life education] programs became forums for promoting positive health practices, critical thinking, and values clarification. Classrooms [have become] laboratories for building skills in communication, responsible decision-making, and assertiveness" (181a). Consistent with the Center's analysis, a mid-1980s survey of States and large school districts conducted by the Alan Guttmacher Institute defined sex education as "instruction in the public schools about human sexual development, the process of reproduction and related topics" (104). However, as noted in the text, it is often difficult to determine from the evaluation literature just what takes place in any set of education programs related to human sexuality (see 104). Not all programs termed sex education programs are restricted to a reproductive and "facts only" approach that may have characterized the sex education of the past, however (181a), and not all "family life" education programs fulfill all the demands and expectations that many educators and parents place on them.

[60] Life skills and decisionmaking programs by some definitions may be included under sex education or family life education. They are discussed separately from sex education programs here in an attempt to distinguish their effects from education-based programs that are strictly didactic.

Table 10-4—State Education Agencies and Large School Districts' Position on the Teaching of Selected Topics in Sex Education, 1988[a]

	Percentage distribution by topic[b] [c]			
Position on teaching	Abstaining from sex	Prevention of pregnancy[c]	AIDS education[d]	Other STD education[d]
State education agencies' position:				
Require/encourage	82%	66%	94%	88%
Discourage/prohibit	0	4	0	0
No position	18	30	6	12
Local school districts' position:				
Require/encourage	91%	81%	96%	93%
Discourage/prohibit	0	4	1	4
No position stated	9	16	4	6

[a] The data presented in this table were obtained in a national survey of State education agencies and the 203 largest school districts in the United States, conducted by researchers at the Alan Guttmacher Institute in 1988. Forty-nine States (all but South Dakota) and the District of Columbia and 162 (80 percent) of the school districts responded to the survey.

[b] Percentages may total more than 100 because of rounding.

[c] Topics listed below are as they appeared in the survey questionnaire. The topics were not specifically defined.

[d] It is interesting to note that some States do not consider AIDS or STD education sex education. Thus, more States support AIDS education (46 States and the District of Columbia) or STDs education (43 States and the District of Columbia) than require or encourage "sex education" (40 States and the District of Columbia).

SOURCE: Office of Technology Assessment, 1991, based on data from A.M. Kenney, S. Guardado, and L. Brown, "Sex Education and AIDS Education in the Schools: What States and Large School Districts Are Doing," *Family Planning Perspectives* 21(2):56-64, 1989.

sure to a sex education course had little or no consistent effect on the likelihood that adolescents would engage in sexual activity (41,232). Marsiglio and Mott found that exposure to sex education was positively (but weakly) associated with initiation of sexual activity at ages 15 and 16 but not at ages 17 and 18 (129). For 15- and 16-year-olds, exposure to sex education was a less important determinant of the initiation of sexual activity than other factors. Thus, the evaluations of sex education by these investigators suggest that traditional sex education[61] generally neither encourages adolescents to initiate sexual activity nor encourages them to delay it. One of the problems these investigators noted, however, was that sex education programs were frequently offered to adolescents who had already become sexually active. Marsiglio and Mott found, for example, that half of the females and two-thirds of the males under age 19 had engaged in sexual intercourse before receiving formal sex education (129).

In terms of getting adolescents to use contraceptives, Zelnik and Kim found that females who had taken a sex education course were more likely to report use of birth control at first intercourse than those who had not (232). The studies by Dawson and by Marsiglio and Mott also found that young females exposed to sex education were more likely to report use of contraceptives when they became sexually active, especially if they received instruction in both the mechanisms of pregnancy and contraceptive use prior to initiating sexual activity (41,129).

Zelnik and Kim found that sexually active females who had taken a sex education course were less likely than who had not received sex education to report having been pregnant (232); however, no verification (e.g., hospital records) of these reports of avoiding pregnancy was available. Dawson found that exposure to sex education had no consistent effect on responding females' likelihood of becoming pregnant (41).

The validity of conclusions from the evaluations of sex education based on national surveys of students is open to question. These studies use data relying on students' self-reports and retrospective recall for information about the timing and content of sex education and the incidence of sexual activity and pregnancy. The studies also combine data from

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[61] OTA has assumed that the sex education programs delivered to individuals participating in the national surveys were "traditional" sex education, that is, they did not include major life-skills decisionmaking or life options components. In fact, as noted below, one problem with studies based on data from national surveys is that such studies are, in effect, averaging a potpourri of programs that differ in content, intensity, timing, goals, and biases. A conclusion that such programs did not include relatively new components such as life-skills decisionmaking or life options components seems justified in light of the fact that all studies used data on sex education programs developed either early in or before the 1980s (41,129,232).

Table 10-5—Evaluations of School- or Community-Based Sex Education, Life Skills Training, and Other Programs

Study[a]	Program characteristics	Participant characteristics	Evaluation method	Findings
Evaluations of sex education based on national surveys:				
Zelnik and Kim, 1982	Various—"course related to sex education."	Nationally representative sample of females ages 15 to 19 in 1976 or 1979, and males ages 17 to 21 in 1979, living in Standard Metropolitan Statistical Areas. N = 2,193.	Telephone survey; included questions on sexual activity, use of contraceptives, premarital pregnancy, and sex education courses (including course content).	Exposure to a sex education course was not significantly associated with engaging in sexual activity. Among sexually active females, those who had taken a sex education course were less likely to have been pregnant than their peers who had not taken a sex education course; among sexually active females in the 1979 survey, those who had taken a sex education course were more likely to use birth control at first intercourse than those who had not.
Dawson, 1986	Various—formal instruction in schools or organized community programs.	Participants in 1982 National Survey of Family Growth. N = 1,888 females ages 15 to 19.	Analyzed self-report data on whether respondents had received formal sex education (included questions about content of sex education courses) and on initiation of intercourse, knowledge and use of contraceptives, premarital pregnancies.	Exposure to formal sex education had no consistent effect on responding females' likelihood of initiating sexual intercourse or becoming pregnant. Sexually active females who had received sex education reported knowing how to use more contraceptive methods than sexually active females who had received no instruction. Among females who had ever used birth control, those who reported receiving education on how pregnancy occurs and on how to use contraceptive methods were more likely to report using birth control at first intercourse than those who had not received such information in sex education courses.
Marsiglio and Mott, 1986	Various—"course related to sex education."	N = 6,015 males and 6,054 females, ages 19 to 27 at time of interview in 1984. Participants in National Longitudinal Surveys of Labor Market Experience—Youth Cohort (NLSY) 1979-84.	Longitudinal analysis of retrospective self-report data.	Males in the sample were less likely than females to have had exposure to a sex education course before engaging in sexual intercourse. Among female respondents, prior exposure to formal sex education was positively (but relatively weakly) associated with initiation of sexual activity at ages 15 and 16 (but not at ages 17 and 18), but other factors (infrequent church attendance, parental education of less than 12 years, black race) were stronger determinants of females' first intercourse at 15 to 16 years. Among female respondents ages 17 and 18 in 1982, those who had taken a sex education course were more likely to use effective birth control methods than those who had never taken such a course.

Table 10-5—Evaluations of School- or Community-Based Sex Education, Life Skills Training, and Other Programs—Continued

Study[a]	Program characteristics	Participant characteristics	Evaluation method	Findings
Evaluation of various types of exemplary sex education programs:				
Kirby, 1984	Various—programs in 9 sites: peer education, parent-child, school-based, community conferences; 5-session to year-long programs	Various—*primarily* high school students; matched comparison groups included in some sites.	Questionnaires administered to participants 3 times: pretest, posttest, and 3- to 5-month followup; assessed knowledge, attitudes, and sexual behavior. Estimates of pregnancy rates obtained in some locations.	Most programs significantly increased participants' knowledge about conception and contraception; greater knowledge gains were found in classes with younger students; longer, more comprehensive programs did not produce greater knowledge increases than short-term programs. Parent/child programs increased parents' comfort in discussing sex with their children, and increased the frequency of self-reported parent-child communication. The programs had no significant or consistent effects on participants' initiation of sexual activity or contraceptive use. In the 4 sites where pregnancy data were collected, the programs had no impact on pregnancy rates.
Evaluations of school-based decisionmaking, assertiveness, and life skills training programs:				
Schinke, Blyth, and Gilchrist, 1981	Life Skills Counseling (LSC) program: In 14 50-minute group sessions offered instruction in reproductive biology and in use of contraceptive methods; problem-solving training; and communication and assertion skills training.	N = 36 high school sophomores (19 females, 17 males).	Students were randomly assigned to one condition of a Solomon 4-group design (pretest, training, and posttest; training and posttest; pretest and posttest; and posttest only). Evaluation included tests of problem-solving; videotapes of role-played interactions involving sexual decisionmaking; measures of attitudes toward contraceptive use, self-reported birth control use, knowledge of reproduction and birth control.	LSC program participants had higher levels of knowledge about sexual facts and probabilities, better problem-solving abilities, and better assertion skills at posttest than controls. At 6-month followup, LSC participants were more favorably disposed to birth control use and reported better contraceptive use than controls.
Barth, Fetro, Leland et al., in press	Life Skills Counseling (LSC) program: See above	Pretest N = 1,033 high school students, with 586 in the treatment group and 447 in the control group (who took their school's standard sex education course). Posttest N = 832 students. 6-month followup = 722 students.	Questionnaires were administered to participants 3 times: pretest, posttest, and 6-month followup. These assessed knowledge, intentions to avoid unprotected sexual intercourse, current and past use of birth control; observational ratings of teacher effectiveness in implementing the program; parental survey.	LSC participants' knowledge about birth control and reported intentions to avoid unprotected sexual intercourse improved, and improvement was maintained at 6-month followup. LSC participants reported increased frequency of birth control use; no change in rates of sexual activity or pregnancy. Students who started having sex after the program had lower rates of sexual activity and were more likely to report using condoms.

Continued on next page

Table 10-5—Evaluations of School- or Community-Based Sex Education, Life Skills Training, and Other Programs—Continued

Study[a]	Program characteristics	Participant characteristics	Evaluation method	Findings
Howard, 1985; Howard, 1988; Howard and McCabe, 1990	Postponing Sexual Involvement (PSI) Program, a public-school-based program, offered basic factual information regarding reproduction and contraceptive use; provided decisionmaking skill training, "social inoculation" and assertiveness training in 10 classroom periods. It was taught by trained high school (11th and 12th graders) students and staff from a hospital-based teen clinic.	N = 536, 99% black, mostly low-income, drawn from hospital's service population. Included 8th graders from public schools receiving the PSI intervention (N = 395) and a comparison group of 8th graders (N = 141) from other school systems in the same metropolitan area.	PSI program participants and comparison group participants were interviewed by telephone at beginning, middle, and end of 8th grade; followups were conducted at beginning and end of 9th grade were questions on sexual behavior included in a larger survey of health habits.	Among students who had not been sexually active before the programs began (N = 365), students in PSI schools were significantly less likely to have become sexually active by the end of the year and continued to be less likely to become sexually active through the end of the next year (i.e., the end of the 9th grade) than comparison group students. Among students who were already sexually active when the programs began, PSI had no effect on their frequency of sexual activity. Although more sexually active students in PSI schools than in comparison schools reported using contraceptives, it is unclear if the reported difference was statistically significant.
Christopher and Roosa, 1990	Success Express Program, a Title XX Adolescent Family Life act-funded program consisting of 6 sessions that focused on self-esteem, communication skills, peer pressure, and teaching the value that sex should be confined to marriage. Program conducted in 8 sites, of which were schools, and 3 of which were unidentified community sites. Control groups were classes in the 5 schools that did not receive the intervention.	N = 191 participants, 129 controls, all middle school-aged, average age 12.8 years, 61% female, majority Hispanic (69%) or black (21%), most from low-income families.	Questionnaires on self-esteem, quality of family communication, and premarital sexual behaviors and attitudes were administered immediately before the first intervention session and 6 weeks later at the final session. Experimental participants were more advanced in grade level than the comparison group; this factor was statistically controlled in the analysis.	Only change was that participants, especially males, reported more engagement in precoital sexual activity than controls did (e.g., touching genitals). Interpretation of results was confounded by the fact that 41% of participants (v. 30% of controls) failed to complete the post-test questionnaire; these were considered program dropouts. Dropouts were more sexually active and more likely to believe in sex at younger ages than were non-dropouts, suggesting that the abstinence-based program was not appealing to large segments of the target population.

Table 10-5—Evaluations of School- or Community-Based Sex Education, Life Skills Training, and Other Programs—Continued

Study[a]	Program characteristics	Participant characteristics	Evaluation method	Findings
Roosa and Christopher, 1990	Same as Christopher and Roosa, 1990 but in 20 sites	N = 399, 129 controls, all early adolescents, average age 13, 57% female, majority Hispanic (64%) or black (12%), family income not provided. Participant sites included public and parochial schools, community centers, Indian reservations, and Police Athletic League branches. Control sites were classes in participant or neighboring schools.	Same as above, but used age as a covariate (controls were older).	No desired changes in attitudes toward abstinence or in sexual behaviors. Incongruously, control group significantly increased age at which they expected to have sex for the first time by 1 1/2 years, compared to a 1/2 year increase for participants. Study dropout rate was higher among participants (34%) than for controls (24%).
Eisen, Zellman, and McAlister, 1990	Sexuality and contraceptive education program based on health belief model and social learning theory. Program combined lectures, simulations, leader-guided discussions, and role-playing (including gender-role reversals). Experimental programs had more active adolescent participation than comparison programs. Experimental and comparison programs based on traditional sex education model were delivered in 7 varied settings, including schools, county health departments, summer work-study programs.	N = 1,444 at baseline, 1,328 at immediate followup, 888 at 1-year followup. 13- to 19-year-olds included, but 96% were 17 or younger; 52 percent female; mostly low socioeconomic status; 15% white, 24% black, 53% Hispanic, 8% Asian; 42% did not live with 2 parents; 62% had had previous sex education experience; 36% had had sexual intercourse. Differences by experimental and comparison group not provided.	Using multivariate analysis to control for background variables, and excluding Asians from the analysis because of language issues, analyzed changes over time and between experimental and comparison groups, based on self-reports of sexuality-related knowledge, beliefs and behavior, including knowledge of and use of effective contraception; statistically controlled for some baseline and other (e.g., demographic) factors.	At immediate followup, there were significant differences between experimental and comparison adolescents in sexual knowledge but no significant changes in health beliefs. At 1-year followup, there were significant differences between experimental and comparison adolescent males (but not females) in *maintenance of abstinence*, and significant differences in *consistent use of effective contraceptives* for females (but not males) who initiated intercourse in the course of the study and for males who had already been sexually active. Noted cumulative effect of prior sex education. The analysis was somewhat flawed in that all comparisons were made at the individual level of analysis, although some of the randomizations had been done at the group level of analysis.

Continued on next page

Table 10-5—Evaluations of School- or Community-Based Sex Education, Life Skills Training, and Other Programs—Continued

Study[a]	Program characteristics	Participant characteristics	Evaluation method	Findings
Weed and Olsen, 1990	Sex Respect Program: Public-school-based program; classroom instruction, student presentations in the community; and publications, videos, and other materials made available to school libraries.	Questionnaires were administered to N = 4,000 students, 2,900 students who had been in the Sex Respect Program previously in junior high schools which implemented the program on a schoolwide basis and 1,100 students who were a matched comparison group. Data reported were from 1988-89 and included students who had not received the program (comparison group), students who had just received the curriculum and were evaluated pre and post, and students who were being followed up; students were evaluated at various sites in the Midwest.	Questionnaires were administered to students in the Sex Respect Program; pre and post curriculum followup and every year after for 3 years; this evaluation reported the findings for 1988-89, which included students who did not receive the curriculum, students who had recently received the curriculum and who were given pretest and posttest questionnaires, and students who had received the curriculum in the past and were being followed up.	Sex Respect Program participants' attitudes and values about the benefits of delaying sexual activity were strengthened immediately after receiving the curriculum and maintained to a lesser extent over a 2-year followup period. Differences in sexual activity rates were minimal and nonsignificant at 2-year followup; however, decreases in levels of sexual activity were larger and more enduring for girls, for younger students, and for those who started the program as virgins.

[a] Full citations are listed at the end of this chapter.

SOURCE: Office of Technology Assessment, 1991.

students involved in many different types of sex education programs; these aggregate data may obscure results achieved by a specific program. Thus, the inability of gross evaluations of school-based sex education programs to demonstrate a significant impact on targeted behaviors may be a result of the content, quality, and intensity of the specific programs offered rather than the intervention strategy itself. The national surveys on which the three evaluations described above were based were not really able to disaggregate the impact of specific types of sex education programs on adolescent pregnancy because they averaged the findings of a variety of programs that differ from one another. It is unclear from these surveys what type of sex education class the adolescents (or adults) participated in. Even when questions were asked of survey respondents about the format and emphasis of sex education classes, the actual implementation of the curricula was not observed by the evaluators. These and other problems associated with the nature of the data collected (e.g., the use of retrospective data) call into question the validity of the conclusions drawn from these studies.

Evaluation of Educational Programs Based on Observations of Multiple Program Types—Kirby evaluated several different types of sex education programs in nine sites (see table 10-5). The programs, which Kirby selected for evaluation because they were believed to be exemplary, represented a range of different program types (e.g., a peer education program, a parent-child program, as well as more traditional classroom-based didactic programs) and lengths (107). Kirby cautions, however, that it is not prudent to generalize his findings regarding these programs to all sex education programs.

Kirby's study was unusual in its attempt to be relatively methodologically rigorous (e.g., using pretest and posttests of knowledge, attitudes, and behavior, and matched comparison groups) and to measure relatively long-term (3- to 5-month) effects of the programs (107). Student and parent evaluations of the programs were also collected. In addition, relatively objective (i.e., non-self-report) pregnancy and birth data were obtained from clinics at four of the sex education sites chosen.

Most of the educational programs evaluated by Kirby significantly increased participants' knowledge about human sexuality, especially among younger students (107). (Kirby's study is controversial, however, because it found that longer, more comprehensive programs did not produce greater knowledge increases than short-term programs.) Overall, both student and parent evaluations of the programs were extremely positive, findings in themselves which Kirby cites as reasons to continue offering sex education programs (107).

None of the educational programs evaluated by Kirby had any measurable effects on participants' sexual activity, contraceptive use, or pregnancy rates (107). Thus, Kirby's findings based on a range of exemplary sex education programs delivered in the 1980s differed somewhat from the studies based on national survey data, in that the earlier studies found that exposure to sex education was associated with greater contraceptive use (41,129) and fewer self-reported pregnancies (232).

Kirby notes that the demands placed upon sex education are more formidable than those placed on other courses (107). As he says, most classes are not evaluated using measures of behavior outside the classroom: for example civics classes are not evaluated by measuring students' later voting behavior; English classes are not evaluated by measuring students' improvements in their speech and thinking outside of class (107,107a). Sex education programs, on the other hand, are expected not only to increase students' knowledge about sexuality and related topics but also to effect changes in behaviors that are subject to many influences outside the classroom.

School-Based Decisionmaking, Assertiveness, and Life-Skills Training Programs—School-based decisionmaking, assertiveness, or life-skills training combine the provision of sex education with training in problem-solving, decisionmaking, or interpersonal communications skills (86). Some programs of this type have no stated position on the appropriateness of engaging in or abstaining from sexual activity and focus instead on helping young people identify their own values (148). Other programs explicitly communicate the value of abstinence and postponement of sexual activity and emphasize helping young people develop the skills to resist pressures to become sexually active.

It may be important to note at this point that some observers of sex education policy see an inherent conflict in sex education that provides a "double message"—that is, that it is necessary and appropriate to explicitly encourage students not to have sex but also to encourage them to use contraception if they do have sex (107a). As Kirby notes, however, educators are beginning to recognize that adults commonly tell adolescents that they should not do certain things (e.g., drink alcohol, take courses above their level of competence), but that if they do, they should take certain precautions (e.g., drink very little, and not drive after drinking or with someone who has been drinking; seek tutoring). Thus, increasingly, according to Kirby, "this double message is viewed as a realistic approach to a difficult problem and is losing some of its negative press" (107a).

One school-based intervention that gives adolescents factual information about conception and contraception and teaches decisionmaking and assertiveness skills without emphasizing a specific set of values regarding sexual activity is the *Life Skills Counseling (LSC) program* developed at the University of Washington (see table 10-5). The LSC program provides adolescent participants with factual information about human reproduction and contraception; it also provides training in decisionmaking skills related to dating, sexuality, birthcontrol, abortion, childbearing, and parenthood to help adolescents clarify their own values and make responsible decisions (180,181). The LSC program also teaches participants communication skills and strategies for resisting peer pressures to engage in sexual activity, but it presents such resistance as one of several possible alternatives rather than as the best alternative.

In 1981, Schinke and colleagues performed an initial evaluation of the LSC program that showed promising results in terms of getting students not to engage in unprotected sexual intercourse (see table 10-5). This evaluation among a group of 36 high school sophomores (19 females and 17 males) found that students who participated in the LSC program had more positive attitudes toward birth control use and greater knowledge of sexual facts, myths, probabilities, and sequelae than a comparison group of students who did not participate (180). LSC participants also demonstrated significantly better communication skills and better abilities to resist pressure from "partners" to engage in unprotected sexual intercourse. Six months after the end of the LSC course, students who had participated in the LSC program reported greater use of birth control methods and fewer instances of unprotected sex than comparison students (73,179,180). Schinke and colleagues' evaluation did not obtain information on rates of sexual activity or pregnancy among the students, so the LSC program's impact on the incidence of sexual intercourse or pregnancy is unknown. Also, because the LSC approach was tested on students who were asked to participate on a voluntary basis, there is a high probability of selection bias influencing the outcomes. Thus, further information on the LSC's program's applicability for larger, more diverse groups of adolescents is needed.

Recently, Barth and colleagues evaluated a large-scale program using the LSC model in 13 high schools in California (see table 10-5). For Barth and colleagues' evaluation, a diverse group of more than 1,000 sexually active and inactive adolescents was recruited, and in most cases, the students were randomly assigned to either an LSC curriculum or to their school's standard sex education curriculum (15). (In some schools, when there were classes of unequal size, larger classes were assigned to the LSC group.)

Barth and colleagues found that students in the LSC program demonstrated greater knowledge about contraception than students who received their school's standard sex education curriculum did; students in the LSC program also reported increasing the frequency of their use of birth control methods and reported having more positive intentions of avoiding unprotected intercourse (15). Barth and colleagues also found that students who received the LSC curriculum and who started having intercourse after the program began were more likely than students in the control group to report using a condom. Overall, however, Barth and colleagues found that students in the LSC group did not have lower rates of sexual activity or pregnancy than students in the control group.

In 1990, Eisen, Ullman, and McAlister performed an evaluation of *a sexuality and contraceptive program based on the health belief model and social learning theory* (see table 10-5). This program involved lectures, simulations, and leader-guided discussions (51). The intervention was unusual in that it was at least in part, an explicit test of a participatory model of sexuality education. Social learning theory predicts that successful enactment of a behavior (e.g., convincing a partner to delay having sex) will encourage that behavior in the future. In contrast, many educational interventions rely on lectures or at most discussion of sex-related issues.[62] The evaluation showed that this more participatory approach can have some success, in that participating adolescent males (but not females) were more successful than comparison males in maintaining abstinence, and participating adolescent females (but not males) were more successful than comparison females in using contraception effectively (51). Like many other evaluations, this evaluation was somewhat flawed in that it relied on self-report data, rather than on observations of changes in pregnancy rates, to test outcomes.

The *Postponing Sexual Involvement (PSI) program* developed at Emory University in Atlanta, Georgia, a prominent example of the abstinence-promoting approach to decisionmaking and assertiveness training, was part of a larger classroom-based sex education program carried out in the Atlanta public schools (see table 10-5). The PSI program sought not only to provide adolescents with factual information on human sexuality but also to help them recognize and respond to social pressures (e.g., from advertising) and peer pressures to engage in sexual activity through assertiveness training and peer counseling (93,94,95).

Howard and colleagues performed a large-scale evaluation of the PSI program in which they compared sexual knowledge, sexual activity, and pregnancy rates among students in the Atlanta public schools who were involved in the PSI program and students from county schools in a neighboring area where the PSI program was not offered (93,94,95). Their sample included nearly 600 mostly black, low-income eighth graders, 395 of whom received the PSI intervention and 141 of whom did not. Howard and colleagues found that the PSI program seemed to be effective in helping young adolescents (especially females) delay sexual activity (95). Although they found that the PSI program had no effects on rates of pregnancy or frequency of sexual activity among participants who were sexually active before the program started, they did find lower frequencies of sexual intercourse and fewer pregnancies among PSI participants who became sexually active after the program had started (93,94,95). The decreases in pregnancy rates need to be interpreted with caution, though, because small sample sizes were used to make comparisons and the statistical significance for these differences in rates was not reported.

In another set of evaluations of an abstinence-only pregnancy prevention program involving the teaching of communication skills, Christopher and Roosa found disappointing results (see table 10-5). A six-session program for middle-school adolescents that focused on self-esteem, communication skills, peer pressure, and teaching the value that sex should be confined to marriage resulted in an *increase* in precoital sexual activity (i.e., not in sexual intercourse) in program participants, but not in the control group (36a). Another evaluation of this abstinence-only pregnancy prevention program found that none of the desired changes in attitudes or behavior occurred for the sample as a whole or for the subgroup who had never had sexual intercourse (172a).

An example of a school-based program that combines assertiveness skills with values clarification is the *Sex Respect Program* for young adolescents in the Midwest (see table 10-5). The goal of the Sex Respect Program was to reduce participants' sexual activity and pregnancy rates by improving their awareness and recognition of the potentially harmful consequences of early sexual activity, by improving skills to help them resist pressure to be sexually involved, and by preventing early sexual activity (220). The Sex Respect Program planned to infuse regular education programs for young adolescents with a greater emphasis on saying "no" and also aimed to foster peer pressure on behalf of self-restraint from sexual activity. There was some emphasis on disseminating information more generally in the community.

Entire schools administered the Sex Respect curriculum in mandatory junior high school classes. For an evaluation by Weed and Olsen, students participating in the Sex Respect Program were asked to complete questionnaires before and after their participation (220). Weed and Olsen found that students' attitudes and values about the benefits of delaying sexual activity appear to have been strengthened by the Sex Respect Program, because more students responded positively to questions like "Do you think there are benefits to waiting until marriage to have sex?" after receiving the Sex Respect curriculum. Weed and Olsen found that differences in sexual activity rates among program participants were minimal and nonsignificant at 2-year followup; however, decreases in levels of sexual activity were larger and more enduring for girls, for younger students, and for those who started the program without ever having had sexual intercourse.

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[62] The difference between this participatory program and other participatory life-skills interventions is not immediately clear. Life-skills training typically has a participatory component so that adolescents can learn strategies and skills for various aspects of surviving, living with others, and succeeding in a complex society. Social learning theory-based interventions are typically based on self-efficacy theory, which focuses intensively on one behavior at a time. The evaluators of the social learning theory-based program were not able to tell how well the theoretical aspects of the program were actually implemented (51). In addition, the intervention was partially based on the health belief model of changing health-related behaviors. The evaluation found that health beliefs did not change, however (51).

Parent-Child Communication Programs—Some programs supported by the Office of Adolescent Pregnancy Programs in the Office of Population Affairs in DHHS and other organizations[63] seek to prevent or delay early sexual activity among young adolescents by improving parent-child communication (148). Such programs are based on the belief that parents prefer and will promote sexual abstinence and responsible sexual decisionmaking among their children (86). Many family communication programs focus on basic interpersonal communication techniques (e.g., taking time to establish relationships, recognizing natural communication barriers focusing on the adolescent's concerns) to enable parents to communicate more effectively with their adolescent children (148).

Evaluations by Kirby and others of parent-child communication programs indicate that such programs do increase the frequency of communications between parents and adolescent children about sex, as reported by parents and children, and increase the comfort of both with such discussions (60,107,107a, 186a). So far, however, there have been no assessments of the long-term impact of on parent-child communication patterns, and there are few data on the effect of parent-child communication programs on adolescents' sexual behavior or unintended pregnancy (148). Kirby, for example, did not find that parent-child communication programs reduced adolescents' sexual behavior or unintended pregnancies (107).

Community-Based Education Programs—Community-based education programs for pregnancy prevention can take a number of forms. In recent years, for example, community organizations (e.g., churches, youth organizations such as Boys' and Girls' Clubs) have developed teen theater projects to offer pregnancy and contraceptive information to diverse groups of adolescents or to reinforce messages about the values of abstinence from sexual intercourse and responsible sexual decisionmaking (148). Such programs usually involve adolescents in developing scripts and producing either live performances or radio and television pieces targeted to other adolescents. No evaluation data to indicate the effectiveness of such projects in increasing adolescents' knowledge or affecting their sexual behavior are available (148).

Some communities have experimented with media campaigns to raise consciousness about the issues of adolescent pregnancy and provide outreach to adolescents in need of support or services (148). Some have used public service announcements, mostly on the radio, to encourage sexual responsibility or provide information about local resources (e.g., hot line or family planning clinic telephone numbers). These efforts have not been evaluated in terms of their impact on adolescents' sexual behavior.

In Los Angeles, the Center for Population Options has initiated a media project intended to serve as a factual resource for television programmers and to encourage commercial television to depict more responsible male-female relationships (148). Project staff report that television programmers have been slow to change their approach to sexuality issues. Network executives consistently avoid subjects such as contraception and abortion which are not considered entertaining and are likely to offend a segment of their viewers.

A Multimodal Pregnancy Prevention Program That Included School- and Community-Based Education—The *School/Community Program for Sexual Risk Reduction Among Teens*, a community-wide pregnancy prevention effort in South Carolina, took, in retrospect, a very broad and comprehensive approach (see table 10-6). Its most "programmatic" aspect was its attempt to coordinate the messages adolescents receive from their schools, churches, homes, community agencies, and the public media.

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[63] A member of OTA's Adolescent Health Youth Advisory Panel, for example, participated in a parent-child communication program on sexuality issues that was sponsored by her local Catholic church (200).

Table 10-6—Evaluation of a Multimodal Pregnancy Prevention Program That Included School- and Community-Based Education

Study[a]	Program characteristics	Participant characteristics	Evaluation method	Findings
Vincent, Clearie, and Schluchter, 1987	School/Community Program for Sexual Risk Reduction Among Teens: Implemented in one rural South Carolina community; school teachers K-12 were trained to incorporate sex education units into existing curricula (e.g., biology, science, social studies); church leaders and parents were trained in sex education; local media were involved in disseminating program messages regarding postponing the onset of sexual intercourse, consistent use of effective contraception among sexually active adolescents.	Females ages 14 to 17 in the target community and a comparison group from demographically similar portion of the country in which the target community was located, as well as from 3 other sociodemographically similar counties in the same State.	Compared estimated pregnancy rates (calculated from local vital statistics data regarding live births, fetal deaths, and induced abortions) within target group (i.e., 14- to 17-year-old females) for years preintervention and postintervention, and compared changes in pregnancy rates from pre to post in target community and comparison areas.	In the first year following the intervention, pregnancy rates among the target group fell from 61.7 pregnancies per 1,000 population to 25.1 per 1,000, while pregnancy rates declined only slightly (from 63.1 pregnancies per 1,000 population to 58.8 per 1,000) in the comparison portion of the target county, and increased in the 3 comparison counties. In the second year postintervention, pregnancy rates in the target area remained at the same low level, while rates continued to decline slightly in the comparison portion of the county, and continued to increase in all 3 comparison counties.
Koo and Dunteman, 1990	Reanalysis of Vincent et al., 1987 above, plus consideration of effect of distribution of contraception by school nurse and school-linked health center.	Same as Vincent et al. in the target community, and a comparison group of 7 counties with initial similar estimated rates of adolescent pregnancy.	For number of 14- to 17-year-olds, used published target group denominator as in Vincent et al., and State projections for comparison group denominators. In calculating estimated pregnancies, added certain proportions of live births and abortions occurring to 18-year-olds that could be estimated to have been conceived when they were still 17, for a "pregnancy conception rate." Learned about pregnancy prevention activities and programs in comparison counties, but could not quantify. Attempted to quantify, but could not: level of "family planning coverage" (i.e., contraceptive distribution) in target and comparison communities; content and extent of community-and school-based educational interventions. Quantified number of teachers remaining to teach pregnancy prevention education. Compared estimated pregnancy conception rates quantitatively for pre-program period 1981-82, program periods 1983-86 and 1984-86, and "later intervention" years 1987-88; independent variables varied.	Pregnancy conception rates in the target area decreased between the preprogram period and the early program period and subsequently rose during the "later intervention" period to a level equal to the preprogram period. Although all of the comparison counties experienced some decreases in their adolescent pregnancy rates during the study period, pregnancy conception rates of the target area were significantly lower than those of the noncontiguous comparison areas in 1984, 1985, and 1986, and of the contiguous comparison area in 1984 and 1986. The research team could not determine quantitatively how various factors (e.g., broad-based educational intervention, distribution of contraception) contributed to reduction and subsequent in pregnancy conception rates, but suggested that distribution of contraceptives may have been a substantial contributing factor.

[a]Full citations are listed at the end of this chapter.

SOURCE: Office of Technology Assessment, 1991.

The School/Community Program for Sexual Risk Reduction was implemented in a rural community in South Carolina beginning in 1982 (117,215). The goal was to reduce the number of teen pregnancies, primarily by postponing the onset of initial sexual activity and secondarily by promoting consistent use of birth control among adolescents who had chosen to become sexually active. Teachers and administrative staff in schools and professionals in community agencies within the target community were given training in sexuality education, and sex education was then taught at all grades in the schools. Church leaders and parents were provided with sex education "minicourses," and additional educational programs for community adolescents were developed in some churches and community agencies. Peer counselors were trained. The local newspaper and radio station were used to heighten community awareness of the program through public media campaigns. In addition, a school nurse in the target school provided male students with condoms, took female students to a nearby family planning clinic to obtain contraceptives, and provided both male and female adolescents with information and counseling (117). During the course of the School/Community Program efforts, an onsite school-linked health center (SLHC) known as the "Teen Life Center" opened, and the school nurse and other family planning staff worked in the clinic, but these efforts were not formally part of the School/Community Program (117).

Because of the nature of the School/Community Program for Sexual Risk Reduction Among Teens intervention, it was not possible to design a rigorous experimental evaluation. In 1987, Vincent and his colleagues published an analysis that compared the pregnancy rates for the rural county where the School/Community Program for Sexual Risk Reduction was implemented with pregnancy rates of three other South Carolina counties with similar socioeconomic and demographic characteristics (215). Their assessment of results was based on locally and nationally recorded statistics about birth, fetal deaths, and abortion. Vincent and colleagues found that in the first year following implementation of the School/Community Program, the pregnancy rate among adolescents ages 14 to 17 in the target community declined substantially (from 61.7 pregnancies per 1,000 population to 25 per 1,000); meanwhile, pregnancy rates among adolescents ages 14 to 17 in the three comparison areas increased (an average increase of 8.5 per 1,000) (215). In the second year after the program was started, the pregnancy rate remained the same in the target community while continuing to climb, by an average of 4.5 pregnancies per 1,000, in all three comparison counties (215).

A 1990 reevaluation of Vincent and colleagues' analysis by a team from Research Triangle Institute (RTI), using a more refined data analysis, different comparison counties, and additional years of analysis, also found that pregnancy rates declined more in the study area than in the comparison to other counties (117). However, the 1990 analysis by Koo and Dunteman found that the declines in pregnancy rates persisted for only 3 years following the School/Community Program's full implementation in 1983: the 1984-85, 1985-86, and 1986-87 school years (117). By the 1987-1988 school year, the pregnancy rate for the target community was where it had been in 1981-82.

The reason for the 1990 reevaluation by RTI was that the original findings had become a source of controversy. A major question was whether factors other than the educational portion of the School/Community Program might have influenced the changes in pregnancy rates in the target community. Unfortunately, because of limitations on available data, the RTI evaluators were not able to demonstrate conclusively which specific aspects of the program may have been responsible for the reduction in pregnancy rates. Some investigators attributed the School/Community Program for Sexual Risk Reduction Among Teens' apparent success in reducing pregnancy rates to having adequate funding and time for training, implementation, and followup; a receptive target population; and inclusion of an entire small and cohesive target community in the intervention process (117,215).

In their 1990 reevaluation of the School/Community Program for Sexual Risk Reduction Among Teens, Koo and Dunteman concluded that the provision of contraceptives by the school nurse was probably a key factor in the program's success (117). The nurse appeared to develop trusting relationships with adolescents and provided sexuality counseling and contraceptive services in a school system that supported her effort. The evaluators also noted, however, that the work of the specially trained teachers "undoubtedly" supported that of the school nurse, and vice versa.

In their 1990 reevaluation, Koo and Dunteman tried to determine why the pregnancy rate in the target community rose to its preintervention level by the 1987-88 school year (117). A number of factors seem to have contributed to the increase. From interviews with community members and teachers, Koo and Dunteman noted that the overall educational program lost much of the momentum it had had when the School/Community Program began and pregnancy rates began to drop (117). Teachers who had been specially trained in the program curriculum left the school system. Other teachers reported that the requirements of a new minimum competency test for students made them feel that they did not have sufficient classroom time to devote to the pregnancy prevention curriculum.[64]

Perhaps most important, Koo and Dunteman found, in 1987, the State of South Carolina banned the distribution of contraceptives in school-based clinics such as the Teen Life Center (117).[65] As a result of this ban and the fact that a nearby family planning clinic was closed when the Teen Life Center was opened on school grounds, the only family planning services that adolescents had available to them were 9 miles away from the school. There was no public transportation in this rural community (215). Finally, the school nurse who had reached out to the students, counseled them on contraceptive use, and actually provided condoms to the male students or driven female students to the family planning clinic to obtain contraceptives, resigned in 1988 (117).

The lesson of the School/Community Program for Sexual Risk Reduction Among Teens and its specific implementation in the target community in South Carolina appears to be that a comprehensive, well-thought-out program combining the major elements theoretically desirable for such a venture, supported by the provision of sexuality counseling and contraceptive services by a trusted school nurse working within and supported by the school system, will, based on the best available evidence, work to reduce adolescent pregnancy (117). What implementers of similar programs in other communities should learn, according to the RTI team, is to avoid eventual complacency and to provide sufficient and timely resources so that an appropriate and believable evaluation can be made (117). OTA suggests that it is possible, but not certain, that a valid evaluation showing that the availability of contraceptives was a necessary (if perhaps not sufficient) part of the adolescent pregnancy reduction effort, would have helped to ward off the State legislative change that inhibited adolescents' access to contraception.

Summary of the Effectiveness of Educational Programs—Evaluations based on national surveys suggest that school-based sex education does increase young people's knowledge about conception and contraception (see table 10-10). There is little evidence that sex education courses affect participants' sexual activity or use of contraceptives and no evidence that they affect participants' pregnancy rates. Those who favor sex education in the schools nevertheless say that such courses are worthwhile because they provide students with basic knowledge they will use throughout their lives (74a).

Kirby's evaluation of various types of sex education programs (e.g., peer education, parent-child communication) in nine sites similarly found that most programs significantly increased participants' knowledge about conception and contraception (especially younger participants' knowledge), but had no significant or consistent effects on their initiation of sexual activity, contraceptive use, or pregnancy rates.

A school- and community-based, theory-based sexuality and contraceptive education program that combined lectures, simulations, leader-guided discussions, and role-playing increased participants' sexual knowledge but not their health beliefs (see table 10-5). This program seemed to affect some participants' sexual behavior and contraceptive use.

School-based decisionmaking, assertiveness, and life-skills training programs such as the Life Skills Counseling (LSC) program, the Sex Respect Program, and the Postponing Sexual Involvement (PSI) program combine the provision of sex education with training in assertiveness and decisionmaking (see table 10-5). The LSC program, which does not emphasize any particular set of values regarding sexual activity, looks promising in terms of improving knowledge of sexual facts and getting sexually active adolescents to use contraceptives but not in terms of reducing such adolescents'sexual activity or pregnancy rates. But LSC students who were not sexually active at the time of their participation reported lower rates of sexual activity and greater use of condoms than control group students who took standard sex education. The PSI program, which explicitly encourages abstinence, looks promising in terms of helping young adolescents (especially females) delay sexual activity. Other abstinence-promoting efforts evaluated by Roosa and Christopher experienced large dropout rates and no apparent success in favorably changing attitudes or behaviors related to sex; in fact the level of reported noncoital sexual activity among males increased. The Sex Respect Program, which combined assertiveness skills with values clarification, strengthened participants' belief in the benefits of delaying sexual activity but had minimal effects on their sexual activity rates. Decreases in sexual activity were larger and more enduring for girls and younger students.

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[64] Minimum competency tests and their effect on school environments and adolescent well-being are discussed more generally in ch. 4, "Schools and Discretionary Time," in this volume.

[65] According to the RTI team, the South Carolina legislature was reacting to publicity about the School/Community Program (117).

Parent-child communication programs seem to increase the frequency of and level of comfort with communications about sex between parents and their children, but data on the impact of such programs on adolescents' sexual behavior or unintended pregnancy are generally not available. Community-based education approaches range from teen theater to public service announcements. Public service announcements seem to be relatively underdeveloped and potentially effective information and outreach tools (148). The evaluation of these efforts (and contraceptive advertising on radio and television) in terms of their impact on adolescents' sexual behavior is difficult, however, because of the difficulty of determining what segment of the target population is reached (148).

The success of the School/Community Program for Sexual Risk Reduction Among Teens, a pregnancy prevention effort in South Carolina, was initially attributed to intensive school- and community-based education, but a subsequent evaluation concluded that the provision of contraceptives and one-on-one contraceptive counseling by a school nurse were probably important factors in reducing the rate of adolescent pregnancies (see table 10-6). The evaluators concluded that a *comprehensive, well-planned program combining community-wide educational efforts and the provision of sexuality counseling and contraceptive services by a trusted school nurse working within and supported by the school system could help to reduce adolescent pregnancies.*

Programs That Provide Contraceptives to Adolescents

The distribution of contraceptives is one of the primary approaches to pregnancy prevention taken by traditional family planning programs, special adolescent clinics, comprehensive school-linked health centers (SLHCs), and condom distribution programs.[66] Evidence on the effectiveness of such programs in preventing pregnancy is presented below.[67]

In reviewing interventions that attempt to increase sexually active adolescents' contraceptive use, it is important to keep in mind the limitations for adolescents of currently available contraceptive methods. An overview of contraceptives available to U.S. adolescents is provided below. Oral contraceptives (the "pill") and the use of condoms appear to be effective means of birth control for adolescents when they are used properly, but research suggests that many adolescents are inconsistent or ineffective contraceptors (148). Part of the reason may be that adolescents find existing methods difficult to use or unappealing for other reasons. Some observers have found that adolescents' failure to use contraceptives or their discontinuation of contraceptives is sometimes associated with a fear of side effects or belief that contraceptives interfere with sexual spontaneity or enjoyment (98a). Further research to identify factors that may enhance adolescents' motivation to use contraceptives and the development and testing of contraceptives that are more acceptable and appropriate to the needs of sexually active adolescents could ameliorate this problem.[68]

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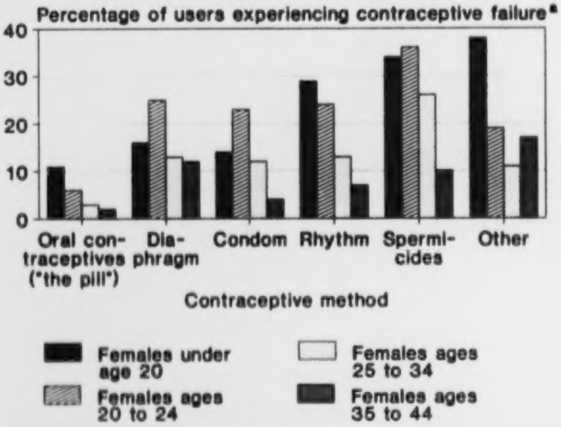
[66] The distribution of contraceptives by a school nurse was one feature of the South Carolina community's successful multimodal pregnancy prevention effort discussed in the preceding section.

[67] Adolescent health care clinics and SLHCs are discussed at length in ch. 15, "Major Issues Pertaining to the Delivery of Primary and Comprehensive Health Services to Adolescents," in Vol. III.

[68] Some of the barriers to adolescents' use of condoms are discussed in ch. 9, "AIDS and Other Sexually Transmitted Diseases: Prevention and Services," in this volume.

Overview of Contraceptive Methods Available to U.S. Adolescents—As shown in table 10-7, the contraceptive methods most commonly used by U.S. adolescents include oral contraceptives (''the pill''), condoms, diaphragms, vaginal spermicides, rhythm, and withdrawal (coitus interruptus). Intrauterine devices (IUDs) are generally not recommended for adolescents. Oral contraceptives, diaphragms, and IUDs must be obtained through a physician in private practice or in family planning or other clinics (148). Condoms, vaginal sponges, and various spermicides can be obtained at drug stores without a prescription (148). No contraceptive method other than abstinence is 100 percent effective in preventing pregnancy, but some methods (e.g., oral contraceptives, condoms) are considerably more effective in preventing pregnancy among U.S. adolescents than others. Theoretical and actual failure rates of various reversible contraceptive methods in terms of preventing pregnancy among U.S. females under age 20 are shown in table 10-7. Many contraceptive methods are less effective in preventing pregnancy for adolescents than they are for adults (see figure 10-12).

Figure 10-12—Percentage of U.S. Female Contraceptive Users Experiencing Contraceptive Failure During the First 12 Months of Use, by Age and Method of Contraception



[a]Standardized by race and marital status.

SOURCE: Office of Technology Assessment, 1991, based on E.F. Jones and J.D. Forrest, "Contraceptive Failure in the United States: Revised Estimates From the 1982 National Survey of Family Growth," *Family Planning Perspectives* 21(3):103-109, 1989.

A large majority of sexually active adolescents who use contraceptive methods make use of prescription methods, especially oral contraceptives (85). Oral contraceptives are among the most effective means of preventing pregnancy in adolescents, but one of their drawbacks is that they do not offer protection against acquired immunodeficiency syndrome (AIDS) or most other sexually transmitted diseases (STDs). Condoms are a nonprescription contraceptive method that seems to afford adolescents a level of effectiveness in preventing pregnancy that is almost as great as the level offered by prescription methods and, at least in adults, also provides substantial protection against AIDS and other STDs (76).[69] One encouraging trend found by the 1988 National Survey of Family Growth was that the use of contraceptives at first intercourse among U.S. females ages 15 to 19 had increased substantially since 1982, rising from 48 percent in 1982 to 65 percent in 1988 (59a). Most of the improvement was due to the increased use of condoms at first intercourse (59a).

A recent study by the National Research Council and the Institute of Medicine on issues affecting the development of new contraceptives identified a number of emerging contraceptive methods (130). Because of the difficulties in estimating the length of the development process for new contraceptives, it is impossible to say when emerging methods will become available.[70] Examples of new and emerging contraceptive technologies that may offer adolescents more effective protection against pregnancy than existing methods are described in box 10-B. Some of these methods are likely to have fewer side effects than existing methods, and others will offer the advantage of greater convenience of use or greater protection against AIDS and other STDs. Thus, some new and emerging contraceptive technologies may be used more consistently and correctly by sexually active adolescents, possibly resulting in fewer pregnancies.

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[69] The effectiveness of condoms in preventing the transmission of AIDS and STDs in adolescents is not known because most studies in adolescents have investigated condom use as a method of contraception only. See ch. 9, ''AIDS and Other Sexually Transmitted Diseases: Prevention and Services,'' in this volume for further discussion of studies of the effectiveness of latex condoms lubricated with nonoxynol-9 in preventing the transmission of AIDS and STDs in adults.

[70] Of the nine contraceptive methods determined by OTA in 1982 to be ''highly likely'' to be available before 1990 (198), only three were being marketed in the United States by mid-1989 (130).

Table 10-7—Overview of Contraceptive Methods Most Commonly Used by U.S. Adolescents

Contraceptive method[a]	Theoretical rate of failure in terms of preventing pregnancy[b]	Actual rate of failure in U.S. females under 20[c]		Selected advantages for adolescents[d]	Selected disadvantages for adolescents[d]
		White	Nonwhite		
Oral contraceptives ("the pill")	0.1%	9.3%	18.1%	• Relatively effective in preventing pregnancy • Not linked to sexual activity, requires less planning • May improve acne, dysmenorrhea, anemia • May protect against ectopic pregnancy, ovarian and endometrial cancer, pelvic inflammatory disease (PID)	• Requires gynecological examination and prescription • Can be expensive • Requires daily use by females • Minor side effects (e.g., headaches, nausea, breast tenderness, spotting) • Small risk of serious side effects (e.g., stroke, pulmonary embolism) • Does not protect against AIDS or most other sexually transmitted diseases (STDs)
Condom	2	13.3	22.3	• Inexpensive • Relatively effective in preventing pregnancy • Readily available without prescription • Protects against AIDS and most other STDs • Few side effects • Involves male in contraception	• Linked to sexual activity, requires planning • Requires cooperation of male partner
Diaphragm	3	12.4	35.5	• Few side effects • Protects against some STDs (with use of a spermicide)	• Requires gynecological examination, fitting, and prescription • Linked to sexual activity, requires planning • Sometimes perceived as messy, hard to use • Possibly increases risk of toxic shock syndrome
Spermicides[e]	3	35.0	34.0	• Inexpensive • Readily available without prescription • Few side effects • May increase lubrication during sex • Protect against some STDs	• Linked to sexual activity, requires planning • Allergic reactions for some (women or partners)

Table 10-7—Overview of Contraceptive Methods Most Commonly Used by U.S. Adolescents—Continued

Contraceptive method[a]	Theoretical rate of failure in terms of preventing pregnancy[b]	Actual rate of failure in U.S. females under 20[c]		Selected advantages for adolescents[d]	Selected disadvantages for adolescents[d]
		White	Nonwhite		
Rhythm (calendar)	10	22.8	34.1	• No side effects • Virtually no cost • May help young women learn about their bodies and menstrual cycles	• Decreased effectiveness in women with irregular menstrual periods (e.g., younger adolescents) • Requires periods of abstinence • Does not protect against AIDS or other STDs
Withdrawal[f] (coitus interruptus)	4	34.0[g]	61.5[g]	• Virtually no cost • No side effects • Involves male in contraception	• Requires cooperation and self-control by male partner • Likely to diminish sexual pleasure • Does not protect against AIDS or other STDs

[a] Several contraceptive methods are not included in this table. The intrauterine device (IUD) is not included because it has been implicated as a possible causative agent in pelvic inflammatory disease and is generally not recommended for use in adolescents (189). Sterilization is not included because it is generally not considered appropriate for adolescents. Also not included are NORPLANT® (a 5-year contraceptive implant approved by the Food and Drug Administration for use in the United States in December 1990) or cervical caps. As of early 1991, the effectiveness and safety of these methods in adolescents had not been specifically evaluated, and other questions concerning their use in adolescents remain.

[b] This column shows, among those who initiate use of a method and who use it perfectly (i.e., consistently and correctly during each act of intercourse), the lowest expected percentage of women who will experience an accidental pregnancy during the first year of use if they do not stop using the method for any other reason. The figures were derived from R.A. Hatcher, et al., 1988 (76).

[c] This column shows, among females under 20 who participated in the 1982 National Survey of Family Growth, the percentage of females who became pregnant accidentally during the first year of use of a given contraceptive, corrected for underreporting of abortions. The figures were derived from E.F. Jones and J.D. Forrest, 1989 (97).

[d] The information in this column was derived largely from R.A. Hatcher, et al., 1988 (76), and A. Rosenfield, 1989 (174).

[e] Vaginal spermicides come in a variety of forms: contraceptive foam, spermicidal suppositories, creams and gels with spermicidal effects (sometimes used with a diaphragm or cervical cap). Vaginal contraceptive sponges and condoms that contain spermicides are also available.

[f] Withdrawal (coitus interruptus) is not a method suggested by family planning providers.

[g] These figures may not accurately reflect failure rates for withdrawal, since contraceptive failures resulting from use of both withdrawal and douche, as well as other miscellaneous methods mentioned by adolescent respondents, were combined. Separate data on failure rates for withdrawal alone in this population are not available.

SOURCE: Office of Technology Assessment, 1991, based on E.F. Jones and J.D. Forrest, "Contraceptive Failure in the United States: Revised Estimates From the National Survey of Family Growth," *Family Planning Perspectives* 21(3):103-109, 1989; R.A. Hatcher, F. Guest, F. Stewart, et al., *Contraceptive Technology 1988-1989*, 14th rev. ed. (Atlanta, GA: Printed Matter, Inc., 1988); and A. Rosenfeld, "Modern Contraception: A 1989 Update," *Annual Review of Public Health* 10:385-401, 1989.

Box 10-B—Examples of New and Emerging Contraceptive Technologies

Efforts to develop contraceptives that are easier to administer and use, are more effective and have fewer side effects, and are less costly than existing contraceptives could be of great importance to adolescents. In recent years, however, several major U.S. pharmaceutical companies have abandoned their contraceptive research and development programs (143a). Thus, public sector funding and the increased activity of nonprofit groups and small entrepreneurial firms has become increasingly important to the development of new contraceptive methods.

Several examples of new and emerging contraceptive technologies of possible importance to adolescents, including modifications of existing technologies, are discussed below.

Contraceptive Methods for Females—In Western Europe, Canada, and some developing nations, several new methods for delivering contraceptive hormones to women to control their ovulation have been available for as long as a decade; other new methods for delivering hormones to women are still being developed. Most of these delivery systems release contraceptive steroids into the bloodstream at a constant, slow rate and in smaller doses than existing oral contraceptives. Contraceptive steroids do not protect against acquired immunodeficiency syndrome (AIDS) or most sexually transmitted diseases (STDs). Examples of new methods of delivering contraceptive hormones to females to prevent pregnancy include the following:

- *Contraceptive implants*—In December 1990, the U.S. Food and Drug Administration approved use in the United States of NORPLANT®, a set of nonbiodegradable progestin-releasing capsules that are surgically inserted under the skin of a woman's arm. A version of NORPLANT® currently available in over 12 countries provides up to 5 years of highly effective (less than 1 percent failure rate) protection against pregnancy (83a). The capsules are somewhat visible after insertion, but if a woman wants to become pregnant, the capsules can be removed by a trained health professional. The incidence of serious health problems associated with NORPLANT® is low, but data on long-term health effects have not been systematically collected (83a). Furthermore, the field trials of NORPLANT®, like those for most drugs, excluded women under age 18. Data about NORPLANT's effectiveness and side effects in adolescents, therefore, are not currently available. Other contraceptive implants being tested include biodegradable pellets. The contraceptive effects of biodegradable pellets (unlike those of NORPLANT®) could be reversed only in the first few months following the pellets' insertion (before they began to degrade).
- *Contraceptive injections*—Contraceptive injections of long-acting progestins with high rates of effectiveness in preventing pregnancy are currently available in many countries of the world. The most commonly used progestins are medroxyprogesterone (Depo Provera®) and norethindrone enanthate (76). Depo-Provera®, a progestin injection administered to a woman once every 3 months, is highly effective in preventing pregnancy (failure rate of less than 1 percent) and is used by approximately 4 million women worldwide. Because of concerns about its safety, the U.S. Food and Drug Administration has not approved

Subsidized Family Planning Clinics—Family planning services—which typically include birth control information and counseling, provision of contraceptives, pregnancy testing and counseling, gynecological examinations, and referrals for related services such as primary care—are available to adolescents through private physicians and through a variety of public and private nonprofit health providers (e.g., public health departments, and private nonprofit clinics supported by organizations such as Planned Parenthood).[71]

As the National Academy of Sciences' Panel on Adolescent Pregnancy and Childbearing has pointed out, most family planning clinics have been almost exclusively female-oriented in both their approach and the services they offer (148). However, new strategies are being used in programs designed specifically for adolescent males (see section below on programs for adolescent males).

Adolescents, especially black females, tend to use family planning clinics more often for obtaining contraceptives than they use private physicians (207a,234). In the 1988 National Survey of Family Growth, 30.4 percent of 15- to 19-year-old females reported one family planning visit in the 12 months preceding the survey (207a). For their most recent

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[71] As discussed later in this chapter, about 4,000 public and private nonprofit family planning providers receive Federal grants under Title X of the Public Health Service Act.

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it for use in the United States (76). Several other types of injectable contraceptives with high rates of effectiveness are currently available in different parts of the world. In addition, new formulations of injectable contraceptives that use microcapsules for gradual release of hormones over a longer period of time are undergoing clinical testing.

- *Transdermal patches containing contraceptive hormones*—Transdermal patches, currently being used to provide estrogen replacement therapy to postmenopausal women, are being tested as contraceptive devices. Worn on the body and replaced at regular intervals by the user, these patches could provide a continuous low-level dose of contraceptive hormones. In one system, a new patch is worn each week for 3 weeks of the month; then the patch is removed for a week to allow menstrual bleeding to occur (143a).
- *Vaginal rings containing contraceptive hormones*—Vaginal rings (of about the same circumference as a diaphragm) that continuously release contraceptive hormones are undergoing clinical trials. The rings can be removed for a few hours without compromising their effectiveness in preventing pregnancy (a failure rate of 3.5 percent in one trial). They would have the advantage of being readily reversible, but their use would require a level of familiarity and comfort with their genitals that some adolescents may not have.

Research on contraceptive vaccines for females, which would immunize women against either pregnancy-related hormones or against male sperm, is still in the early stages (143a). In theory, such methods would require initial immunizations, possibly in a series of shots, after which periodic booster shots would be necessary to continue to control a women's fertility. A contraceptive vaccine would have the disadvantage for some users of not being readily reversible. For sexually active adolescents, most of whom do not wish to become pregnant while still in school, however, a contraceptive vaccine might be very appealing. On the other hand, the use of a contraceptive vaccine would probably not protect against AIDS or most STDs.

Two modifications of barrier methods of contraception for females that are currently being tested in the United States are disposable diaphragms that contain spermicides, and condoms that line the vagina, are larger than condoms for males, and may provide greater protection against STDs. Like the vaginal rings, as well as the currently available diaphragms and the contraceptive sponge, such methods require a level of comfort and familiarity with one's genitals that some adolescents may not have. More effective spermicides, including spermicides that not only protect against pregnancy but also provide greater protection against STDs, are currently being developed (143a).

Contraceptive Methods for Males—Contraceptive methods that inhibit the production of a man's sperm or affect the sperm's ability to fertilize the human egg still require substantial basic research. Hormonal or vaccine contraceptives for males are not likely to be available for general use in the United States for at least a decade. Gossypol, a cotton seed derivative has been used as an oral contraceptive for males in China, however, and this or other nonhormonal, nonendocrine contraceptive methods may hold promise (143a).

SOURCE: Office of Technology Assessment, 1991.

source of family planning services in 1988, two-thirds of 15- to 19-year-olds used a family planning clinic (207a).[72]

Various factors may affect adolescents' decision to use family planning clinics rather than private physicians' services.[73] One reason that some adolescents seeking contraceptive services prefer public or private nonprofit family planning clinics to private physicians is undoubtedly cost. Adolescents typically have limited personal incomes, and physician fees for birth control services are almost four times higher on average than clinic fees for comparable services (34).

Another reason some adolescents prefer clinics to private physicians is concern about confidentiality in visiting private physicians (34,112). This concern may be well-justified. Data from a national sample of private physicians indicate that only 59 percent of general and family practice physicians are willing to provide contraception to minors without parental consent, although 80 percent of obstetricians and

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[72] Interestingly, the use of family planning clinics by white adolescent females increased between 1982 and 1988 (from 44.0 percent to 60.6 percent), but use by black adolescent females decreased (from 73.7 percent to 65.4 percent) (207a).

[73] For further discussion of factors that may affect adolescents' access to services, see ch. 15, "Major Issues Pertaining to the Delivery of Primary and Comprehensive Health Services to Adolescents" and ch. 16, "Financial Access to Health Services," and ch. 17, "Consent and Confidentiality in Adolescent Health Care Decisionmaking," in Vol. III.

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gynecologists are willing to do so (161).[74] A recent survey of primary care physicians (general and family practitioners and internists) found that only 57 percent thought that it was acceptable to make contraceptives available to minors without parental consent (222). In contrast, a 1982 study found that only 14 percent of clinic providers required parental consent or notification for contraceptive services to minors (69).

Some critics of family planning programs have expressed concerns that such programs increase adolescent sexual activity, pregnancy, abortion, and birth rates. As shown in table 10-8, the findings of studies using a rather global approach to examining the effects of the availability of family planning services are contradictory. Some studies have found a positive association between the availability of family planning services and higher adolescent pregnancy rates, and some studies have found negative associations.

A 1977 study by Moore and Caldwell found that the availability of subsidized family planning services in States was associated with a lower occurrence of pregnancy among black adolescents ages 16 to 18 (138). This finding did not hold for whites, perhaps because black adolescents rely more on public family planning services and are therefore more affected by their availability than are white adolescents. Moore and Caldwell also found that the availability of subsidized family planning services was associated with lower out-of-wedlock pregnancy rates among 15- to 19-year-old blacks.

A 1981 study by Forrest and colleagues found that areas with greater increases between 1970 and 1975 in the proportion of adolescents enrolled in subsidized family planning clinics had larger declines in adolescent birth rates (59). The authors estimated that for every 10 adolescents ages 15 to 19 involved in a public family planning clinic program in 1975, almost 3 pregnancies and 1 birth were averted in 1976. The authors also estimated that during the 1970s, over 2.6 million pregnancies to adolescents were prevented through use of federally funded family planning clinics (59).

But a 1982 study of family planning services in California by Kasun found a positive association between levels of spending for family planning services and adolescent pregnancy rates and concluded that increased availability of contraceptive services led to higher levels of sexual activity among adolescents (100).

A 1986 study by Olsen and Weed found that higher levels of utilization of family planning clinic programs by adolescents nationwide were associated with higher pregnancy rates among adolescents (156). Family planning enrollment by females ages 15 to 19 seemed to result in an average increase of about 120 pregnancies per 1,000 adolescent family planning patients. This study found a decline in birth rates associated with family planning program involvement by adolescents but attributed it to family planning programs' effects on pregnancy continuation rather than occurrence.

A 1990 study by Lundberg and Plotnik found a positive association between restrictive State laws governing the availability of contraceptives and high rates of premarital adolescent pregnancies; this study also found a negative association between the availability of family planning services for Medicaid-eligible women and *high* rates of premarital adolescent pregnancies (124b).

There are several possible reasons for the conflicting findings of studies using a global approach to examine the effects of the availability of family planning services on adolescent pregnancy. The studies use different levels of aggregation (counties, States), different time periods (e.g., late 1960 through 1971 [138] v. 1979 to 1986 [124b]), and different units of analysis (e.g., States [59] v. individuals [124b,138]). The studies also differ in statistical methods, measurement of policy and program variables, and indicators of pregnancy (e.g., birth rates [59], nonmarital childbearing [124b], pregnancy rates [156]).

Family Planning Clinics With a Special Emphasis on Adolescents—Some family planning and general health clinics operate teen clinics, where adolescents are served separately from other clinic patients and services are tailored to adolescents' needs for confidentiality, sexuality and birth control information, after-school hours of operation, and low costs (83). Others have special outreach and followup programs for young people (e.g., work to maintain contact with adolescent patients following

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[74] For a discussion of State laws and U.S. Supreme Court decisions related to consent and confidentiality in the provision of family planning services to minors, see ch. 17, "Consent and Confidentiality in Adolescent Health Care Decisionmaking," in Vol. III.

Table 10-8—Evaluations of Contraceptive Provision Policies and Programs

Study[a]	Program characteristics	Participant characteristics	Evaluation method	Findings
Subsidized family planning clinics:				
Moore and Caldwell, 1977	I. Percent of need for subsidized family planning services met in State, 1969.	I. 1,479 black and 3,132 "other" (mostly white) females ages 15 to 19 in a national probability sample; surveyed in 1971.	I. Used regression analysis to determine estimated effects of meeting need for subsidized family planning services in respondent females' State of residence.	I. Availability of subsidized family planning services in States was negatively associated with the occurrence of pregnancy among older (ages 16 to 18) black females. No association for other age groupings, or between availability of subsidized family planning services and transition to first intercourse.
	II. A. Existence of State laws limiting family planning services to females 18 and older. B. Availability of subsidized family planning.	II. Out-of-wedlock birth rates among 15- to 19-year-olds, by States, 1971.	II. Compared policy and program characteristics to out-of-wedlock birth rates, aggregated at State level.	II. A. Existence of laws limiting contraceptive services was associated with higher out-of-wedlock pregnancies. B. Availability of subsidized family planning services was associated with lower rate of out-of-wedlock pregnancies among blacks only. No relationship for whites for either variable.[b]
Forrest, Hermalin, and Henshaw, 1981	Family planning clinic programs that receive Federal funds under Title X of the Public Health Service Act (the Family Planning Services and Population Research Act of 1970) in 1975 to 1976.	Adolescents ages 15 to 19 in 1970 and 1975 who participated in federally funded family planning clinic programs.	Used multivariate analysis, with counties as the unit of analysis, to assess the impact of family planning clinic use on birth rates among adolescents. Used aggregates of the proportion of adolescents enrolled in federally funded family planning clinics, the rate of births in 1976 to adolescents ages 15 to 19 in 1975 as the outcome measure, and compared birth rates in 1970 and 1976. Used national data on the relationship between birth rates and pregnancy rates to estimate the effect of family planning programs on pregnancy and abortion rates among adolescents ages 15 to 19.	For both white and nonwhite adolescents, areas with greater increases between 1970 and 1975 in the proportion of adolescents enrolled in family planning clinics had larger declines in birth rates among 15- to 19-year-olds from 1970 to 1976. For every 10 patients ages 15 to 19 who were enrolled in family planning clinics in 1975, the authors estimated that 2.82 pregnancies to adolescents (for a total of 331,000 pregnancies) were prevented in 1976. For every 10 patients ages 15 to 19 who were enrolled in family planning clinics in 1975, the authors estimated that 1.01 births to adolescents (or a total of 119,000 births) were averted in 1976.
Kasun, 1982	Family planning services in California.	Unknown.	Compared levels of spending for family planning services with adolescent pregnancy rates.	Positive association (i.e., the higher the level of family planning spending, the higher the adolescent pregnancy rate).
Olsen and Weed, 1986; Weed and Olsen, 1986	Organized family planning clinic programs in all 50 States and the District of Columbia, as surveyed by the Alan Guttmacher Institute in 1975.	Females ages 15 to 19 in 1975 who were clients of organized family planning clinic programs.	Used regression analyses, with States as the unit of analysis, to assess the effect of levels of enrollment of adolescents ages 15 to 19 in family planning programs on birth rates and pregnancy rates among adolescents. Used available State-level estimates of abortion rates and birth rates among adolescents to develop estimates of overall pregnancy rates.	The level of enrollment of adolescents ages 15 to 19 in organized family planning programs was associated with increased and decreased birth rates among 15- to 19-year-olds. Although not as significant a predictor of teen pregnancy rates as several demographic variables (i.e., the ratio of married to unmarried 15- to 19-year-olds in each State and the percent of the State population that was white), family planning program enrollment by adolescents seemed to result in an average increase of about 120 pregnancies per 1,000 adolescent family planning program patients.

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Table 10-8—Evaluations of Contraceptive Provision Policies and Programs—Continued

Study[a]	Program characteristics	Participant characteristics	Evaluation method	Findings
Lundberg and Plotnick, 1990	4 policy or program variables at State level; 1) restriction on contraceptive licensing, advertising, or selling; 2) proportion of counties in which family planning clinics serve < 50 percent of low-income women at risk of unintended pregnancy; 3) proportion of teenage women at risk who obtain family planning services; and 4) proportion of Medicaid-eligible women at risk of unintended pregnancy served by family planning clinics.[c]	11,181 white females who were ages 14 to 16 in the first (1979) round of NLSY and provided data on premarital pregnancies and other pregnancy-related events for the period 1979 to 1986.[d]	Nested logit analysis	Largest (and significant) effects on premarital pregnancy were found for variables 1 and 4.
Family planning clinics with a special emphasis on adolescents:				
Chamie, Eisman, Forrest, et al., 1982	Various family planning clinics in 37 counties throughout the United States, all with at least 200 adolescents a year.	Included 124 clinic directors, over 3,500 "teenage" clinic patients and over 6,000 adult patients (ages not specified), plus approximately 1,000 pharmacists and 1,000 physicians in the counties where the clinics were located.	Using data from survey questionnaires of all participants, compared characteristics of clinics in counties identified as having a high proportion (average 75 percent) of their sexually active adolescent population served by family planning clinics ("high-met-need" counties) with clinics in counties that had a lower proportion (average 28 percent) of sexually active adolescents who were family planning clinic patients ("low-met-need" counties).	Clinics in "high-met-need" areas were more likely to have special outreach and followup programs for adolescents, to provide services to minors without requiring parental consent, to combine family planning with other health services, to provide free services to adolescents, and to see adolescents on a walk-in basis. Although the rates of adolescent pregnancy in both types of counties were similar (about 32 percent), adolescents in "low-met-need" counties were more likely to have terminated their last pregnancy, while those in "high-met-need" counties were more likely to have given birth.

Table 10-8—Evaluations of Contraceptive Provision Policies and Programs—Continued

Study[a]	Program characteristics	Participant characteristics	Evaluation method	Findings
Kisker, 1984	Same as Chamie, Eisman, Forrest, et al., 1982 (see above)	Same participants as Chamie, Eisman, Forrest, et al., 1982 (see above)	Using data from survey questionnaires of all participants, factors predicting three indicators of clinic effectiveness in serving adolescents (mean delay between teenage patients' self-reported first intercourse and first visit to a family planning clinic; clinic retention of teenage patients, as reported by clinic directors; and level of satisfaction with clinic services reported by teenage patients) were studied using regression analyses.	Clinics with community education programs geared to adolescents seem to reduce delay in clinic visits following first intercourse by 4 to 5 months; the support of local churches for teens' use of family planning services appeared to decrease delay by about 3 months, and having active relationships with local youth groups also decreased delay by about 2 months. The longer teenage patients had to travel to get to the clinic, the longer the mean delay: every 5 extra minutes of travel time increased the delay in seeking clinic services by almost a month. Clinics that served more adolescent patients on a walk-in basis also decreased delay. Working with local youth groups increased the ability of clinics to retain teenage patients, as did having at least 3 hours of clinic time in the evening and on weekends and offering a larger range of services to adolescents (e.g., special youth programs, abortion services, prenatal care). Interestingly, clinics that reported greater amounts of counseling and education time with patients slightly raised the mean delay in seeking clinic services and slightly lowered retention of teenage patients, although it also increased teenage patients' satisfaction with clinic services. The authors speculated that teens might perceive the educational services as "preachy," although information about their satisfaction with the educational and counseling services offered was not collected.

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Table 10-8—Evaluations of Contraceptive Provision Policies and Programs—Continued

Study[a]	Program characteristics	Participant characteristics	Evaluation method	Findings
Herceg-Baron, Furstenberg, Shea, et al., 1986	Two special service components for adolescents implemented in existing family planning programs in 9 sites: *family support* services provided short-term (6 week) counseling for adolescents and family members, to support adolescents' contraceptive use and sexual decisionmaking, and *periodic support* in the form of weekly telephone calls from project staff for 6 weeks to monitor adolescents' adjustment to their chosen contraceptive methods.	N = 469, female clinic patients ages 12 to 17, making first visit to clinics. Approximately one-half black and one-half white, one-third under the age of 16; only 13.5% were not yet sexuully active.	Personal interviews were conducted at the time of the first clinic visit, and 2 followups were conducted by telephone approximately 6 months and 15 months later. Patients were randomly assigned to 1 of the 2 special services groups, or to 1 of 2 control groups (the first control group took part in all three interviews, and the second was contacted only for the third interview. Patients in control groups received only those services routinely offered in each clinic site.	Study design was compromised, since only 36% of the patients who agreed to participate in the *family support* services actually attended any counseling sessions, and only 5% of those who attended came with a parent. A total of 84% of those who agreed to *periodic support* were contacted at least once; they averaged 2.6 calls. No significant differences in regularity of contraceptive use or pregnancy rates were found between special services or control groups.
Winter and Breckenmaker, 1991	"A total service delivery system for adolescents, from initial contract to followup," including the following critical elements: one-to-one educational, concrete information, more frequent visits, longer telephone and on-site contacts with staff, special staff training in adolescent development, encouragement of male participation, greater attention to adolescent comfort, confidentiality.	Experimental groups: 518 adolescent females under age 18 in 3 sites. Control groups: 738 adolescent females in 3 control sites, 98 percent whites.	Baseline and post-treatment evaluations at both experimental and control sites.	Clients in experimental site had higher gains in knowledge, more persistent use of contraceptives, greater ease in using contraception, and, for continuing patients, significantly lower pregnancy rates (4.0 v. 7.8%). Differences in pregnancy rates were marginally significant when all patients (including program dropouts) were considered.

Table 10-8—Evaluations of Contraceptive Provision Policies and Programs—Continued

Study[a]	Program characteristics	Participant characteristics	Evaluation method	Findings
School-linked health centers (SLHCs)				
Edwards, Steinman, Arnold, et al., 1980	St. Paul Maternity & Infant Care (MIC) Project: Hospital-linked health clinic located in two high schools; provided pregnancy tests, gynecological exams, contraceptive counseling, referral to hospital clinic for contraceptives, as well as other health services.	Female student population of schools served by clinic program; female users of family planning services in MIC school clinics (N = 403)	Assessed changes over time in birth rates among the female student population; assessed rates of continued use of birth control in female clinic users. (No "pre-post" statistical testing of changes over time was conducted; no comparison group.)	By the end of the 3rd year, the birth rate among females in the clinic schools had dropped from 79 births per 1,000 females to 35 births per 1,000; 86.4% of females who received contraceptives from the MIC project continued to use them for at least 12 months.
Zabin, Hirsch, Streett, et al., 1988; Zabin, Hirsch, Smith, et al., 1986a&b	The Self Center: Hospital-linked health clinic located near 1 junior and 1 senior high school in inner-city Baltimore; a team of clinic staff was assigned to each school; provided class-room-based sex education, group and individual sex education in school health suites and in the clinic, medical services related to reproductive health (e.g., pregnancy tests, gynecological exams, STD testing, provision of contraceptives).	Students in schools linked to the clinic; all students in both clinic schools were black. Comparison group of black students in socioeconomically similar junior and senior high schools in the same school system. N = 667 males and 1,033 females in intervention group, and 944 males and 1,002 females in comparison group, at baseline; 506 males and 695 females in intervention group, and 860 males and 889 females in comparison group, at end of project.	Self-administered questionnaire collected data from all students regarding knowledge of and attitudes toward pregnancy risk and contraceptive use, sexual behavior, and pregnancy experience. Changes over time in these variables were assessed, by length of exposure to the clinic program. School system data on pregnancies among female students in all public schools were used to compare pregnancy rates among females in the 2 program schools with other junior and senior high schools.	Significant increases in knowledge of pregnancy risk and use of contraceptives among students in clinic schools; greater knowledge gains were seen among those with longer exposure to the program. Females age 15 and older who had not been sexually active at the beginning of the program delayed first intercourse for an average of 7 months, when compared with their peers in nonclinic schools. Program increased the percentage of females who attended at clinic for birth control services both before their first intercourse and within a month of initiating sex. By the end of the 3rd year, of the project, pregnancies among females in clinic schools had declined by 30%, while rising 58% in comparison schools.
Kirby, Waszak, and Ziegler, 1989	Various—6 school-based clinics in high schools serving low-income populations; all provided pregnancy testing and contraceptive counseling; only 3 dispensed contraceptives on site.	Various—included from 24% to 90% of student population in clinic schools; 4 sites had comparison groups from sociodemographically similar high schools; predominantly black in 5 sites, substantial Hispanic representation in 2 sites, less than one-fifth white in all sites.	Student health survey (self-report questionnaire) used in all sites; assessed clinic use, use of other medical services, risk-taking behaviors (e.g., drug use, speeding), sexual activity, birth control use, pregnancy experience. Four sites had comparable data from students in comparison schools; 2 sites collected baseline data before clinics opened and posttest data 2 years later.	None of the clinic schools had significantly higher percentages of sexually active students than comparison schools; at 2 sites, students in the clinic schools reported significantly later ages at first intercourse than students in comparison schools. At 2 sites, more students in clinic school samples reported using birth control at last intercourse than in nonclinic or preclinic samples. No differences in self-reported pregnancy (or impregnation, for males) rates were found between clinic school students and nonclinic or preclinic samples.

Continued on next page

Table 10-8—Evaluations of Contraceptive Provision Policies and Programs—Continued

Study[a]	Program characteristics	Participant characteristics	Evaluation method	Findings
Condom distribution programs:				
Arnold, 1973	Outreach workers distributed condoms.	Adolescent males.	Compared fertility rates in target and nontarget areas.	Fertility rate of black adolescent females ages 10 to 19 declined 19 percent compared with no decrease in nontargeted areas.
Kirby, Harvey, Claussenius, et al., 1988	Educational pamphlet and order form mailed. Targeted males could order free condoms.	Adolescent males.	Phone survey asking about condom use.	Educational materials appeared to have no impact on changing attitudes related to sexual behavior. The offer of free condoms did not appear to increase levels of sexual intercourse or increase the possibility of using condoms at last intercourse.

[a] Full citations are listed at the end of this chapter.

[b] It is important to note that although Moore and Caldwell reported that they used multiple regression and explored effects of independent variables, they did not report how much each variable contributed to the outcome of interest. They did note, however, that much of the variance remained unexplained after their analysis (138).

[c] Sources and years of data are explained in Lundberg and Plotnick, 1990 (124b).

[d] Only the portion of the analysis related to the availability of contraception and family planning services is presented here. The impacts of various policies on marriage v. premarital birth and on abortion were also explored (124b).

SOURCE: Office of Technology Assessment, 1991.

clinic visits, to encourage continued use of contraceptives, or to provide outreach through community education and contact with local youth groups) (111). Teen-oriented family planning clinics are more likely to provide free services to adolescents and to see adolescent patients on a walk-in basis than are clinics that are less effective in reaching adolescents (34).

Prior to a recent study by Winter and Breckenmaker (223a), studies of family planning services with a special emphasis on adolescents had found that such services demonstrate only a minimal impact on adolescent pregnancy rates or birth control use (82,111). In 1982, Chamie and colleagues used survey data from family planning clinics and county-level adolescent population data in 37 counties across the United States to devise an index of counties with "high met need" (a high proportion of the sexually active adolescent population being served by family planning clinics) versus "low met need" (a low proportion of the sexually active adolescent population being served by family planning clinics) (34) (see table 10-8). They then compared the counties' level of met need to the counties' adolescent pregnancy, abortion, and birth rates. Clinics in "high-met-need" counties were more likely to have special outreach and followup programs for adolescents, to provide services to minors without requiring parental consent, to combine family planning with other health services, to provide free services to adolescents, and to see adolescents on a walk-in basis. Chamie and colleagues found that adolescent pregnancy rates in low-met-need counties were similar to those in high-met-need counties; however, abortions were more likely in "low-met-need" counties and births more likely in "high-met-need" counties. The authors hypothesized that more of the pregnancies in the "high-met-need" counties might have been intentional, but they did not collect data on pregnancy intentions.

Kisker's 1984 analysis of the same survey data was limited to those adolescents who had actually used the family planning clinics (111) (see table 10-8). Kisker found that several factors characterized family planning clinics that appeared to be more effective either in increasing the delay between initiation of sexual intercourse and the receipt of contraceptive services or in retaining adolescent clients:

- location in communities with community education programs,
- the support of local churches for adolescents' use of contraceptive services,
- active relationships between the clinics and local youth groups,
- less travel time to the clinic,
- service available to adolescents on a walk-in basis, and
- weekend and evening hours (111).

Interestingly, although adolescents reported greater satisfaction with family planning clinics that provided counseling and education (although not specifically with these elements of the clinics' services), the availability of such services was associated with a *greater* average delay between initiation of intercourse and seeking of services.

Chamie's analysis and Kisker's analysis were both based on retrospective reporting by existing family planning clinic programs. In 1986, Herceg-Baron and colleagues attempted to implement and evaluate the effects of special service components (family support and periodic support) for adolescents in family planning clinics (82) (see table 10-8). Unfortunately, the study design was compromised, because only 36 percent of the group of adolescents scheduled to receive family support services attended any counseling sessions, and only 5 percent of those who attended came with a parent. The group of adolescents that was supposed to get periodic support had been scheduled to receive six weekly phone calls from staff to monitor the adolescents' adjustment to their chosen contraceptive methods, but an average of only 2.6 contacts were actually completed. Perhaps as a result, there were no significant differences in regularity of contraceptive use or pregnancy rates between the special services and the control groups.

Winter and Breckenmaker's study in 1991 found, however, that sites that used experimental protocols developed by a committee of family planning clinic personnel and staff of the Family Health Council of Central Pennsylvania had lower adolescent pregnancy rates than control sites had (223a) (see table 10-8). It seems likely that the Pennsylvania protocols led to more favorable results than did the intervention in the Herceg-Baron study because the Pennsylvania protocols actually made changes in the everyday delivery of family planning services rather than adding on new components.

Comprehensive School-Linked Health Centers (SLHCs)—One model for delivering family planning services to adolescents has been the SLHC, in which family planning and other health services are offered to students in a clinic located on or near school grounds.[75] Data describing the services provided by SLHCs are available from a 1990 survey of 153 SLHCs operating during the 1988-89 school year, conducted by the Center for Population Options (95a). Almost all of the 95 responding SLHCs, which operated on-site at schools, provided counseling on birth control methods. About 90 percent of the 95 SLHCs conducted pregnancy tests and performed gynecological examinations, 54 percent provided written prescriptions for birth control methods, but only 21 percent actually *dispensed* contraceptives. At some schools, clinic staff also conduct sex education sessions in classrooms. In comparison to office-based physicians, SLHCs may have the advantage of making health services for adolescents more readily accessible, approachable, and tailored to the specific needs of adolescents.[76]

One of the earliest and most comprehensive SLHCs was established in two public high schools by the Maternity and Infant Care Project of St. Paul-Ramsey Hospital in St. Paul, Minnesota. The *St. Paul SLHC program* exemplifies a model for the provision of family planning services and other health services at a clinic located on the school site (50). The St. Paul SLHC was begun as a means of providing pregnancy prevention and care services (e.g., prenatal and postpartum care, STDs, pregnancy testing, contraceptive information, and counseling) to the students at these schools, but it was rapidly expanded to include a more comprehensive range of health services (e.g., immunizations, general physical examinations) (50).[77]

In 1980, Edwards and colleagues evaluated the school-based program established by the Maternity and Infant Care Project in St. Paul (see table 10-8). They found that the birth rate among female students served by the clinic program dropped from 79 to 35 births per 1,000 students in the first 3 years of the program (50); the birth rate declined even further over time, dropping to 26 births per 1,000 students during the 1983-84 school year (86). The program also demonstrated a very high rate (93 percent) of reported contraceptive continuation among clinic patients in the year following the patients' first clinic visit (50). No data were collected on pregnancy or abortion rates, so it is unclear what proportion of the decline in birth rates was due to a decrease in pregnancies and what portion was due to an increase in the use of abortion. Also, because birth rates were declining nationwide during the time of the study, the lack of an appropriate comparison group limits inferences about the validity of this study's findings.

A variation on the St. Paul model of services is the *Self Center*, a clinic located near both a junior and a senior high school in a low-income neighborhood in Baltimore, Maryland (224). The Self Center was established as a pregnancy prevention demonstration project by the School of Medicine at the Johns Hopkins University. This SLHC made a range of reproductive health care services (e.g., contraceptive counseling, pregnancy testing, provision of contraceptives, educational programs) available after school hours to all students at the two schools. A team of clinic staff was assigned to each of the two schools to participate in the schools' sex education programs, provide individual and group counseling at the schools, and follow up on students who had been seen at the clinic. The Self Center program was able to successfully gain participation among the male adolescents in the school. Males were most likely to participate in informal group discussions and to meet individually with social workers who provided information on and distributed contraceptive devices (225).

In the late 1980s, Zabin and colleagues conducted a relatively well-designed evaluation of the Self Center that compared Self Center students with a carefully matched sample of students from similar urban Baltimore schools (227) (see table 10-8). Over

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[75] As described in ch. 15, "Major Issues Pertaining to the Delivery of Primary and Comprehensive Health Services to Adolescents," in Vol. III, there are substantial variations among SLHC programs. Although all SLHCs aim to provide a wide range of health care services, what particular SLHCs offer varies and depends largely on clinic resources, the particular needs of the community's adolescents, and local attitudes towards providing reproductive health services in a school-linked setting.

[76] For further discussion, see ch. 15, "Major Issues Pertaining to the Delivery of Primary and Comprehensive Health Services to Adolescents," in Vol. III.

[77] This expansion of services away from a strict focus on family planning and other reproductive health services has occurred in most SLHCs. Family planning and reproductive health care are still typically considered part of comprehensive health service delivery for adolescents, however. For further discussion, see ch. 15, "Major Issues Pertaining to the Delivery of Primary and Comprehensive Services to Adolescents," in Vol. III.

3 years of the Self Center's operation, they found, there were significant gains in sexual and contraceptive knowledge among both boys and girls at the schools that received classroom-based sex education and that were linked to the clinic. Adolescent females enrolled in the Self Center program schools for 2 years or more were found to be significantly more likely to delay sexual activity (for an average of 7 months) than adolescent females in the comparison schools.

Zabin and colleagues also found that Self Center students increased their use of contraceptives and were more likely than comparison students to visit the clinic for contraceptive counseling *before* initiating intercourse or in the first few months after initiating sexual activity (227). These results were strongest for those students who were exposed to the Self Center program for 2 years or more. Finally, Zabin and colleagues found a substantial (30 percent) drop in the pregnancy rate at the end of 3 years for sexually active adolescent females in the Self Center program schools, while conceptions among adolescent females in the comparison schools increased significantly (57 percent) during the same time period.

In drawing conclusions about the overall effectiveness of the Self Center program, it is important to recognize some methodological shortcomings of Zabin and colleagues' evaluation. First, the actual numbers of adolescents used for statistical comparisons were small because of attrition rates from the program schools. Second, the high school students involved in the Self Center program were of somewhat higher academic standing than those who were not involved.

In 1989, Kirby, Waszak, and Ziegler performed an in-depth assessment of six SLHCs for the Center for Population Options (110) (see table 10-8). They compared schools in which SLHCs were located with sociodemographically similar schools in the same communities, and found that students in the SLHC schools were no more likely to be sexually active than their peers in the comparison schools (110). In two of the sites, students in the schools with SLHCs initiated sex at older ages (an average of 8 months later). Also, students in two of the SLHC schools (those in which the health center staff provided aggressive outreach for contraceptive education within the school) had higher rates of contraceptive use than the comparison groups did. In three SLHC sites in which contraceptives were dispensed, however, students did not report higher rates of contraceptive use. According to Kirby and his colleagues, these findings suggest that the mere accessibility of contraception may not be sufficient to increase adolescents' contraceptive use (110).

The 1989 study by Kirby, Waszak, and Ziegler found that none of the six SLHC programs had a significant impact on students' sexual activity or self-reported pregnancy rates, not even SLHCs that dispensed contraceptives onsite (110). It may be important to note, however, that the researchers collected pregnancy data from all students at the school and did not just compare clinic users to nonusers. In the three SLHC schools in which clinic users were compared with nonusers, *contraceptive use* was found to be higher among the clinic users, and, overall, from 44 to 90 percent of the pregnancies that occurred in the student body occurred to students who had never attended the clinic (110). In any event, the researchers concluded after careful examination of the programs that the programs were not as strong and integrated within the school as they needed to be to lower pregnancy rates.

In considering the effects of SLHCs on adolescent pregnancy, it is important to keep in mind that the greatest amount of research to date has been conducted on the SLHC programs in St. Paul and Baltimore, both of which were established with the *explicit* goals of reducing adolescent pregnancy and parenting. Other SLHCs—especially those that do not emphasize reproductive health services—may not be able to achieve the same kinds of pregnancy-related outcomes. Furthermore, many SLHCs operate only during the academic year, are not open after school hours, and do not serve students who have dropped out of school. Because of its off-campus location and its after-school hours of operation, the Self Center in Baltimore was able to avoid some of these limitations; the avoidance of those limitations and the Self Center program's explicit and intensive focus on pregnancy prevention may have contributed to the apparent success of this program in reducing adolescent pregnancies.

SLHCs have been opposed on several grounds. There are concerns among some opponents of abortion, for example, that the *real* agenda of clinic supporters is to promote abortions (74); in many SLHCs, though, abortion counseling and referrals are prohibited (148). Another objection is that the provision of contraceptive services by a formative public institution such as a school will legitimate early sexual activity. Another objection to SLHCs is that most existing data do not support the claim that SLHCs reduce adolescent pregnancy rates (65,110). Given the limitations of current evidence, however, it is not possible to conclude that SLHCs do not reduce pregnancy rates. Evaluation designs have been mostly pretest-posttest research designs with no comparison groups, and there have been limitations in the types of data collected.[78]

It has been argued by some that because of the great need for health care in the low-income and minority communities targeted for SLHC locations, families have been reluctant to protest their establishment (74). Unfortunately, information about the level of community support for SLHC programs is limited, although polls conducted in several States have found that over three-fourths of adults surveyed favored the establishment of SLHCs (32,42,135).

Condom Distribution and Other Programs Targeted to Adolescent Males—Contrary to popular opinion, a majority of adolescent males are likely to acknowledge that they bear some responsibility for preventing pregnancy in their sexual relationships and say that they are willing to make use of contraception (166). Whitley and Schofield's recent meta-analysis of 134 studies of adolescent contraceptive use found that the major variables affecting young males' contraceptive use pertain to encouragement by their partner and favorable attitudes towards contraception (221). Despite adolescent males' willingness to be involved in pregnancy prevention, family planning and other pregnancy prevention programs have traditionally focused on young women and have even excluded adolescent males (47,148).

Condom Distribution Programs—Condom distribution programs targeted to males are a notable exception to the general pattern of male exclusion noted above, and such programs have been increasing in number in recent years. The increase in condom distribution programs is partly in response to concerns about AIDS and other STDs[79] and partly due to the recognition by service providers and program planners that use of condoms (the birth control method most frequently used by adolescents at first intercourse) may help in the "vulnerable period" for many young women between initiating intercourse and seeking other contraceptive services (148).

Condom distribution programs targeted to adolescent males have largely been carried out by family planning service providers; distribution locations have included clinics, pharmacies, community and recreation centers, neighborhood shops and restaurants, and other places where young men gather. Some programs have used male outreach workers to distribute educational materials along with the condoms, and to encourage their use (148).

In 1988, Kirby and colleagues evaluated a program that attempted to get adolescent males to use condoms by mailing order forms (109) (see table 10-8). In 1973, Arnold's evaluation of a condom distribution program using outreach workers had found that adolescent males' use of condoms increased in the area targeted by the program both during its implementation and at followup (10) (see table 10-8). In the condom distribution effort that was evaluated by Kirby and colleagues, a sample of adolescent males was sent an educational pamphlet and an order form for free condoms in the mail; in a followup interview, the males who received these items were no more likely to report using condoms than a control group who did not receive them (109). It seems clear from these two examples that direct distribution of condoms would lead to greater condom use than just a mailing of order forms. But these studies provide no conclusive evidence of condom distribution programs' impact on adolescent pregnancy.

Other Efforts To Offer Contraceptives to Adolescent Males—Some efforts to involve young adolescent males in family planning services have recognized that adolescent and young adult males are not likely to make use of services that they perceive to be geared toward young women and that the environment of programs that offer contraceptive services could be changed to make young men more comfortable. Strategies such as hiring young male staff members, offering special male clinics, and changing the physical environment (e.g., by showing sports videos in the waiting room) may help to reach this goal (166). Active outreach by clinic providers to contact adolescent males through existing recreational, educational, employment, or health care programs may be another means of increasing adolescent males' utilization of contraceptives (24, 171). Offering non-sexuality-specific services (e.g., sports physicals, recreational activities) may also attract young men to family planning clinics (166).

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[78] Some studies, for example, have collected data on births to adolescents but have not collected data on all adolescent pregnancies, leading to the assertion that lower birth rates have resulted exclusively from higher abortion rates.

[79] For further discussion, see ch. 9, "AIDS and Sexually Transmitted Diseases: Prevention and Services," in this volume.

In general, there are few data available documenting the strategies on either clinic utilization or impact of contraceptive use among young males. One effort in a health maintenance organization used half of a 1-hour clinic visit to show a highly explicit slide and tape program, and the other half to provide an educational personal health consultation (38a). Participants and controls were randomly assigned to conditions in this rare experiment. Sexually active males who received the intervention were more likely to use a more effective method of contraception, and all participants had greater knowledge of fertility and STDs (38a). The program's effects were generally stronger among those who had not been sexually active before the experiment, a finding that suggests the wisdom of early intervention.

Summary of the Effectiveness of Contraceptive Provision Programs—Programs that provide contraceptives to adolescents show mixed results in terms of preventing adolescent pregnancies (see table 10-8). Studies of the impact of subsidized family planning clinics on adolescent pregnancy have shown contradictory results, so it is difficult to come to conclusions about the effect that these programs have had. Some studies have found a positive association between the availability of subsidized family planning services and reduced adolescent pregnancy rates, and some studies have found a negative association. Family planning clinics with a special emphasis on adolescents have been found in most studies to demonstrate only a minimal impact on adolescent contraceptive use or pregnancy rates; one recent study in Pennsylvania found, however, that protocols that made changes in the everyday delivery of services for adolescents increased adolescents' use of contraceptives and reduced their pregnancy rates (223a). Studies of SLHCs that were established with the explicit goal of reducing adolescent pregnancy and parenting have found that such SLHCs seem to increase adolescents' use of contraceptives but do not always reduce pregnancy rates. Evaluations of condom distribution programs suggest that an active effort to distribute condoms is more likely to get male adolescents to use condoms than is a more passive effort such as offering condoms through the mail.

Programs That Seek To Enhance Adolescents' Life Options

Enhancing adolescents' "life options" is an approach to preventing adolescent pregnancy that has been proposed "in light of the seeming intractability of adolescent pregnancy rates, despite prolonged efforts to expand sexual education and contraceptive services" (47a). This approach is based on the assumption that young people will not be motivated to avoid early pregnancy and parenthood unless they see alternative pathways to achieving adult status. It is supported by evidence that low-income adolescents at risk for dropping out of school are also at increased risk of early pregnancy and parenthood.

Available information about the effectiveness of three types of life options approaches is presented below:

1) life planning and decisionmaking programs,
2) role modeling and mentoring programs, and
3) youth employment programs.

Life planning and decisionmaking programs rely on a curriculum to improve adolescents' life planning and decisionmaking skills so as to enable them to plan for alternatives to early parenthood. The Life Planning Project developed by the Center for Population Options and a pregnancy prevention program developed by the Girls' Clubs of Santa Barbara, California, are two examples discussed below (47a).

Role model and mentoring programs such as Big Brothers and Big Sisters have typically been designed to provide disadvantaged young people (males and females) with positive role models and social support for desirable social behaviors (148). Such programs offer concrete assistance in the form of academic tutoring or job interviewing skills. Most of these programs have not focused explicitly on sexual behavior or pregnancy prevention, but a few programs discussed below explicitly emphasize responsible sexual behavior.

The third kind of life options programs, youth employment programs, offer their participants actual work experience along with social support or interventions to improve their life planning. One example is the Job Corps program for economically disadvantaged youth. This program, which is administered by the Employment and Training Administration in the U.S. Department of Labor, provides employment and training in primarily residential centers for socioeconomically disadvantaged people ages 16 to 21 (148).[80] Other examples of youth employment programs discussed below are the federally funded Youth Incentive Entitlement Projects, the Teen Outreach Program (TOP), and the Summer Training and Education Program (STEP) (148).

As noted earlier, adolescent pregnancy prevention efforts have traditionally focused on adolescent females, and some have even tended to exclude adolescent males. In contrast, some life options programs have included adolescent and young adult males, recognizing that limited work and educational opportunities may defeat young males'—especially low-income and minority males—motivation to be involved in parental responsibilities (1a).

Life Planning and Decisionmaking Programs—The *Life Planning Project* is a curricular program developed by the Center for Population Options and implemented in three communities (47a). The major objective of the Life Planning Project is to help adolescent participants avoid pregnancy, largely as part of planning for their futures (148). The curricular materials emphasize job and career planning, family planning, and methods of pregnancy prevention through various written exercises and group activities. The Life Planning Program involves the participation of a range of youth-serving agencies in each community, whose staff have implemented the curriculum among their adolescent clients (148). Like many pregnancy prevention efforts, the Life Planning curriculum has not been rigorously evaluated. The evaluation that has been done suggests that although the intervention may have improved participating adolescents' knowledge, it did not significantly affect their behavior (148). Because the evaluation had no comparison or control group, it is unclear if even the knowledge gains were a direct result of the intervention itself.

Eight Girls' Clubs have implemented a pregnancy prevention program that includes a curriculum based on a workbook entitled *Choices: A Teen Woman's Journal for Self-Awareness and Personal Planning* (18), which was developed for adolescent females by the Girls' Clubs of Santa Barbara, California. The "Choices" workbook provides adolescents with written exercises and other activities designed to encourage them to think about their future work and family life and to enhance their goal-setting and decisionmaking skills (18).[81] The pregnancy prevention program includes two components for younger adolescent females (mother-daughter workshops designed to enhance communication about sex and a variation on the Postponing Sexual Involvement program discussed earlier) and two components for older adolescent females (the "Choices" workbook and clinic services) (148). The Girls' Clubs program that includes the "Choices" curriculum has been systematically evaluated (86). The results of that evaluation are expected in the fall of 1991.

Role Model and Mentoring Programs—Little information is available on the effectiveness of traditional role model and mentoring programs such as Big Brothers and Big Sisters in reaching their goals of encouraging positive social behavior, and none of these programs have been evaluated for their potential effect on adolescent pregnancy.

Innovative mentoring programs that have explicitly incorporated pregnancy prevention strategies include the Athletes Coaching Teens project developed in the Psychology Department at Virginia Commonwealth University. This program trains high school and college athletes to conduct sessions for younger students on goal setting, life planning, and responsible decisionmaking (39).

Another innovative mentoring program that explicity encourages responsible sexual behavior is a program begun by the Urban League as part of its Adolescent Male Responsibility Program (148). College students in Kappa Alpha Psi, the national black fraternity, serve as mentors to young adolescent males, meeting with them three evenings each week and providing them with remedial education, recreational activities, and community service opportunities. The mentors specifically emphasize responsible sexual behavior. A similar project involving adolescent females with a national black sorority (Delta Sigma Theta) has also been developed (148).

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[80] Additional information on the Job Corps is presented in ch. 19, "The Role of Federal Agencies in Adolescent Health," in Vol. III.

[81] A companion book entitled "Challenges" has been developed for adolescent males; this book has not been used as extensively, however, and there seem to be no plans to evaluate its impact (47).

Although evaluations of all three of the innovative mentoring projects identified above are underway, data on the impact of these innovative efforts on adolescent sexual activity, contraceptive use, or pregnancy were not available as of mid-1991.

Youth Employment Programs—As noted above, youth employment programs include large-scale federally funded programs such as Job Corps programs, which are intended to address employment problems among socioeconomically disadvantaged young people ages 16 to 21 by teaching job skills, providing incentives to employees, and placing individuals in jobs (148). They also include demonstration projects such as the Summer Training and Education Program (STEP), which served adolescents in five cities, and the Teen Outreach Program (TOP) in St. Louis (see table 10-9).

Job Corps and Youth Incentive Entitlement Pilot Projects—Federal and other programs designed to increase the employability of young people from low socioeconomic and minority backgrounds have been in existence for a number of years. Only recently has their potential for adolescent pregnancy prevention been explored. This development follows increasing awareness that a lack of economic opportunities may influence the likelihood that an adolescent will become (or will make someone) pregnant. Most employment and job training programs have not included any explicit instruction in sex education or family planning.

Presumably because many youth employment programs have focused on young males and on employment, information has not been collected on the impact of traditional youth employment programs on adolescents' fertility behavior. One notable exception is a 1978 evaluation of the federally supported Job Corps program (148). That evaluation found that participation in the Job Corps seemed to delay family formation and reduce the incidence of out-of-wedlock childbearing among participants (210). To OTA's knowledge, more recent evidence concerning the impact of participation in the Job Corps on adolescents' childbearing is not available.

One more recent investigation considered the impact on adolescent fertility of the federally funded Youth Incentive Entitlement Pilot Projects. These pilot projects provided jobs to economically disadvantaged high school students who remained in school and maintained adequate levels of school performance (158). The results of the investigation, while not conclusive, seemed to indicate that adolescent females were more likely to delay childbearing (at least until the age of 18) in the communities where the projects were located than were adolescent females in the comparison sites.

Summer Training and Education Program (STEP)—STEP is a 15-month program developed to keep disadvantaged 14- and 15-year-olds from dropping out of school and becoming adolescent parents (185c). With summer income as an incentive, 14- and 15-year-olds who are eligible for the Federal Summer Youth Employment and Training Program (SYETP)[82] enroll in STEP for two consecutive summers of remedial instruction in reading and math, life skills instruction (stressing responsible social and sexual attitudes and behavior), and work experience combined with supportive services during the academic year (see table 10-9). Supportive services offered during the academic year include individual counseling, group activities, workshops, and meetings with parents (21,22).

Developed and managed by Public/Private Ventures, a private nonprofit corporation in Philadelphia, STEP was first implemented in a three-city pilot program in the summer of 1984 (185c). Following that successful pilot, Public/Private Ventures began a national demonstration of STEP in five cities (Boston, Fresno, San Diego, Seattle, and Portland, Oregon). Half the eligible youth interested in participating were randomly assigned to STEP or to a control group who participated in SYETP. In each of the five sites, three cohorts of about 320 youth each are participating in the program and research, so there are about 4,800 youth in the demonstration (185b). Cohort I entered the program in 1985, Cohort II in 1986, and Cohort III in 1987. The operational phase of the program ended in August 1988 with Cohort III's second summer of services, but the long-term research phase of the demonstration (which includes the collection of

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[82] The Federal Summer Youth Employment and Training Program (SYETP) is a U.S. Department of Labor program authorized under Title II-B of the Job Training Partnership Act. It offers 7 to 8 weeks of summer employment and remedial assistance to low-income teenagers. For further discussion, see the section on Federal policies and programs pertaining to adolescent pregnancy and parenting below.

Table 10-9—Evaluations of Youth Employment Demonstration Programs[a]

Study[b]	Program characteristics	Program participants	Evaluation characteristics	Findings
Branch, Milliner, Bloom, et al., 1985; Branch, Milliner, and Bumbaugh, 1986; Sipe, Grossman, and Milliner, 1988	Summer Training and Education Program (STEP): Over a 15-month period, offers 2 consecutive summers of remedial education, life skills instruction, and work experience plus various support services (e.g., counseling) during the school year.[c]	14- to 15-year-olds from low-income families in five cities who are at risk of dropping out of school and becoming adolescent parents. In each of 5 sites, three cohorts (1985, 1986, and 1987) of about 320 youths each are participating, for a total of 4,800 youth in the demonstration.	Eligible youth were randomly assigned to STEP or to a control group (remedial education and summer work experience only).[d] Findings are based on metropolitan achievement test scores, STEP questionnaire responses, school records, and past program interviews.	In the short term, STEP stemmed participants' academic losses and increased their knowledge of contraception. Conclusive statements regarding STEP's long-term impacts on dropout rates and fertility-related behavior must await completion of the study.[e]
Philliber, 1985; Philliber and Allen, 1990; Philliber and Allen, no date	Teen Outreach Program (TOP): An after-school program offered during the academic year with two major components: 1) a twice-weekly discussion group led by trained facilitators, covering topics such as family relationships, peer pressure, sexuality, and focusing on teaching group members to set life goals and develop plans for reaching those goals; and 2) volunteer service placement with community agencies to provide participants with work experience and opportunities to practice job-related skills learned in discussion groups. Students may earn credit toward graduation for participation in TOP.	National sample of junior and senior high school students who enrolled voluntarily in response to announcements or who were identified as being at risk or potentially at risk for school dropout or pregnancy and enrolled by counselors or others. In 1984-85, there were 148 students at 7 sites, in 1985-86 444 students at 16 sites; in 1986-87, 632 students at 35 sites; in 1987-88, 782 students at 44 sites; and in 1988-89, 1,028 students at 60 sites. In 1988-89, over 75 percent of TOP participants were female; average age 15 (range was 11 to 21). In 1988-89, about 40 percent of TOP participants were black, 40 percent were white; and 13 percent were Hispanic; the rest were mostly Asians or Native Americans. About 41 percent came from nonintact families; socioeconomic status varied.	Years 1-4: TOP participants were compared with students in variously matched comparison groups.[f] The evaluations monitored four outcome variables for TOP students and their comparisons: school suspension, failure of courses in school, dropping out of school, and pregnancies. Year 5 (1980-90): Same as in years 1-4, but additional outcome variables were measured.[g] At 5 TOP replication sites, students were randomly assigned to either TOP (79 students) or to a control group (89 students).	Years 1-4 evaluations found positive results among TOP participants. Year 5 evaluation found similar results in the national sample.[h] At the 5 random assignment sites, TOP participants had significantly lower school suspension arrest, and were more likely to get an award. Other differences were not statistically significant. Findings from year 6 of the evaluation will not be available until after 1992.

[a] This table shows evaluations of youth employment demonstration programs and therefore does not include the Job Corps program or other large-scale youth employment programs sponsored by the U.S. Department of Labor. Those other programs are discussed in the text.

[b] Full citations are listed at the end of this chapter.

[c] During the summer, STEP participants spend half their time in remediation and life skills classes and half their time in work experience. All youth are paid minimum wage for their participation with funds from the Federal Summer Youth Employment and Training Program (SYETP), which is funded by the U.S. Department of Labor.

[d] Control group subjects were offered remedial education and a summer through SYETP. They did not receive life skills instruction or supportive services during the school year.

[e] The operational phase of research ended in August 1988, but researchers will follow the youth through 1992.

[f] Each TOP site recruited a local comparison group at the beginning of the school year, preferably using true random assignment procedures (163a). In some sites where random assignment was not possible, student participants identified comparison students for themselves, naming young people who might have filled out intake forms "about like you did." In 1988-89, TOP participants in the national sample were significantly more likely to be female than comparison students (76 percent v. 67.5 percent) and were significantly less likely to have been pregnant (4.5 percent v. 7.8 percent).

[g] The 1988-89 evaluation gathered data not only on the four variables considered in the previous 4 years but also on arrests, skipping school, use of alcohol or marijuana, having sexual intercourse, using contraceptive when sexually active, joining after-school activities, getting an award, getting on the honor role, and educational aspirations.

[h] After background characteristics and baseline levels of outcomes were controlled for, participation in TOP was found to be relatively related to getting pregnant or causing pregnancy, suspension, getting arrested, family courses, and skipping school. It was positively related to using contraception when sexually active, getting awards, getting on the honor role, raising college aspirations, and staying in school.

SOURCE: Office of Technology Assessment, 1991.

school records data and data from personal records) will not be completed until 1993.

Preliminary findings issued in the summer of 1988 were based on four groups of data for each cohort: pre- and post-summer metropolitan achievement test scores, STEP questionnaire responses, school records and postprogram interviews (185c). These preliminary findings indicate that STEP was most effective in stemming participants' academic losses over the summer and in sharply increasing their knowledge of contraception. The preliminary results are consistent with the hypothesis that STEP reduces dropout behavior but are based on small numbers and are not statistically significant. Consistent effects on STEP participants' fertility-related behavior were not found in preliminary results. Nevertheless, final conclusions about STEP's long-term effects on dropout and fertility behavior must await the completion of the research.

Teen Outreach Program (TOP)—TOP is an after-school program designed to prevent early pregnancy, to encourage regular attendance in school, and generally to promote life options among junior and senior high school students at risk of school dropout or pregnancy (163a). The program was begun in 1978 as a collaborative effort between the Danforth Foundation and the St. Louis public school system. In 1983, funding was provided by the Charles Stewart Mott Foundation to begin a 3-year national replication of TOP. In 1987, a second 3-year national replication began under the direction of the Association of Junior Leagues International and the American Association of School Administrators.

TOP consists of two major components: 1) small group discussions about life planning, relationships, peer pressure, sexuality, and parenting and 2) volunteer service experience (163a). A twice-weekly discussion group is led by a trained facilitator,[83] who uses a variety of strategies (e.g., group exercises, role-playing, and homework) to teach group members how to set realistic life goals and develop plans for reaching those goals. Weekly volunteer service placement for the last three-quarters of the academic year provides TOP participants with real work experience and an opportunity to practice job-related skills learned in the discussion groups. Volunteer placements for participants are identified by the trained facilitators, who also supervise the placement process.

The number of TOP sites increased from 7 in the 1984-85 school year to 24 in 1985-86 to 35 in 1986-87 to 44 in 1987-88 to 60 in 1988-89, to an estimated 87 in 1989-90 (163a). TOP evaluations in the first 4 years monitored four outcomes: school suspension, failure of courses in school, dropping out of school, and pregnancies. The evaluation data were fairly consistently positive (164a). The range in the types of students enrolled at the different TOP replication sites and the variability in the comparison groups at the different sites make interpreting the results of these evaluations difficult. Students at some sites volunteered entirely on their own to participate in TOP; at other sites, students were enrolled in the program by counselors or others. Some evaluators asked student participants to identify their own matched comparisons by naming someone who would be likely to fill out intake forms "about like you did." Other evaluators recruited comparison students as a group from other classes (164).

The 1989-90 evaluation of TOP monitored the four outcomes noted above plus several others, including having sexual intercourse and using contraception when sexually active. In this evaluation, five of the TOP replication sites existing at that time were able to conduct a true experiment by randomly assigning at-risk students to either TOP or a control group (163a,164). The results of the 1989-90 evaluation appear somewhat less promising than results suggested by aggregate data from the previous 4 years. In all randomized and nonrandomized sites combined, evaluators found significant differences between TOP participants and comparison students in four indicators: school suspension rates, school failure rates, school dropout rates, and pregnancy rates. At the five sites with randomization, evaluators found that TOP participants had lower school suspension and failure rates than control group students but did not have lower dropout or pregnancy rates. It is important to note, however, that the five sites with randomization included only 79 TOP participants and 89 controls. This small number of students across five different sites makes it difficult to detect differences in such low frequency events as pregnancy.

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[83] All the facilitators for TOP are specially trained secondary school teachers.

Summary of the Effectiveness of Programs That Seek To Develop Adolescents' Life Options— Definitive conclusions about the effectiveness of life options programs are difficult to draw in part because such programs are more difficult to evaluate than programs with a narrower focus and in part because some evaluations are still underway. Nonetheless, some of these programs do seem to show promise. Life planning and decisionmaking interventions that do not provide work experience are probably less successful than those that do provide such experience. One youth employment program, the Job Corps, seemed to delay family formation and reduce out-of-wedlock childbearing among participants, but the evaluation of that program was performed in 1978. An evaluation of the federally funded Youth Incentive Entitlement Projects found that adolescent females in the communities where the projects were located were more likely to delay childbearing than females in comparison sites. Preliminary findings from an evaluation of the Summer Training and Education Program (STEP) indicate that the program reduces 14- to 15-year-old participants' academic losses over the summer and increases their knowledge of contraception, but the evaluation of that program has not been completed, and it is too early to draw conclusions about STEP's long-term impact on dropout or fertility behavior. An evaluation of the Teen Outreach Program (TOP) suggests that this program is somewhat promising in terms of reducing pregnancies and school problems, but methodological problems in the evaluation make it difficult to draw definitive conclusions about its effectiveness in reducing pregnancies. Role model and mentoring projects that emphasize responsible sexual behavior are a recent innovation, and data on their effects on adolescents' sexual behavior are only beginning to be collected.

Economic Incentive Programs

A controversial and experimental approach to preventing *second* pregnancies among low-income adolescents who have already been pregnant before the age of 16 was developed by the Rocky Mountain Planned Parenthood program (101). This program, called Dollar-a-Day, uses money to attract adolescent females to attend a voluntary weekly meeting led by professional counselors. Dr. Jeff Dolgan, then director for the Denver Children's Home, proposed this program after working with adolescents who got pregnant and showed little motivation to prevent future pregnancies. He asked the adolescents what it would take to get them to come to a voluntary program, and their response was that it would take money. Every week, adolescents who attend Dollar-a-Day weekly meetings are given 7 $1 bills for not becoming pregnant. The assumption being made is that adolescents who attend these meetings will receive support and peer pressure not to become pregnant from other adolescents. By helping delay further pregnancies, the program claims to "buy time" for high-risk adolescents, allowing them to mature emotionally and to finish or return to school. It is hoped that participants will discover that parenthood is not the solution to their problems.

Although no formal evaluation was done, records on pregnancy rates for program participants have been kept. Of the 56 adolescents who completed the program, 9 girls (17 percent) have become pregnant. Program designers compare these percentages with national statistics on repeat pregnancies, which the Alan Guttmacher Institute estimates to be between 37 and 50 percent (148). The program proponents claim that the program is successful and that the weekly groups and not the money are responsible for averted births. Their evaluation lacks an experimental control group, however, and it appears that they include pregnancy statistics only on those adolescents who graduate from the program and do not account for the pregnancy rates of those adolescents who drop out of the program. A similar program, the Cash Awards for Teens Who Stay Program, is being administered in Florida (185).

Conclusions About the Effectiveness of Programs To Prevent Adolescent Pregnancy

The prevention of adolescent pregnancy would result in fewer births to U.S. adolescents and would also result in fewer abortions (148). Unfortunately, however, a political consensus in this country about how to prevent adolescent pregnancy has not been—and may never be—reached.[84] As Dryfoos notes in her recent comparative review of prevention programs for delinquency, substance abuse, and pregnancy, "Clearly, when sex enters the scene, the situation becomes complicated" (47a).

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[84] To some extent, this lack of consensus is reflected in Federal programs such as Title X and Title XX of the Public Health Service Act. These programs are discussed later in this chapter.

Dryfoos notes a schism between political "liberals" and "conservatives" on the issue of adolescent pregnancy prevention (47a). Many conservatives take the position that government support for sex education and contraception weakens family ties and encourages promiscuity and that government initiatives should encourage adolescents to abstain from sexual intercourse. Many liberals agree that encouraging adolescents to delay sexual intercourse until full adulthood would be preferable, but are alarmed by the consequences of unprotected adolescent sexuality (i.e., pregnancy, AIDS, STDs) and believe that society's approach should go beyond relying on the abstinence message alone. Scholars are generally frightened away from the topic of adolescent sexuality, and as one result, there is little scientifically valid evaluation of pregnancy prevention programs; the paucity of methodologically sound research makes drawing definitive conclusions about what works difficult (47a,107a,148).

The National Academy of Sciences' Panel on Adolescent Pregnancy and Childbearing concluded in 1987 that "prevention of adolescent pregnancy should have the highest priority" (see box 10-C for the panel's six general conclusions). While noting the lack of rigorous evaluative efforts, the panel felt there was an adequate basis at that time for making recommendations about strategies to prevent adolescent pregnancy (148). The three general strategies that the panel felt could lead to a reduction in the rate of adolescent pregnancies were as follows:

1) enhance the life options of disadvantaged adolescents,
2) delay the initiation of sexual activity, and
3) encourage contraceptive use by sexually active teenagers (148).

"Diligent contraceptive use" by adolescents was considered to be the most effective of these pregnancy prevention interventions, but no program element alone was considered to be sufficient, and specific approaches for implementing the three strategies were provided (148). Central to all the strategies embraced by the National Academy of Sciences panel was "the need for teenagers themselves to embrace values that lead to responsible, healthy, and productive lives, including the avoidance of unplanned and untimely parenting, and to be steadfast in their belief that they can achieve their goals" (148). Parents, other family members, and community and societal norms were seen as playing a key role in helping young people acquire and maintain those values.[85]

Following her more recent review of pregnancy prevention interventions, Dryfoos drew conclusions similar to those of the National Academy of Sciences' Panel on Adolescent Pregnancy and Childbearing, with emphases on early intervention (no later than the middle school years), the use of multiple approaches, and confidential access to contraceptives (47a). As Dryfoos notes:

> No one program component will be sufficient. In every community, young people should have access to a package of services that include both capacity-building[86] and life-option[87] components (47a).

Similarly, in a review of the effectiveness of sexuality education programs, Kirby concluded that such programs must do more than increase knowledge:

> Programs must help adolescents personalize that information, improve their decisionmaking and communication skills, increase their motivation either to avoid sex or to use birth control, change their perception of peer group norms regarding having sex and using condoms, and therefore reduce their risk-taking behavior (107a).

Further, Kirby noted that sex education programs will probably be more effective if they involve adolescents in both shaping the programs and promoting the programs' goals, and incorporate community-wide strategies that are both multifaceted and mutually reinforcing (e.g., 215) (107a). Kirby's review did not examine the effectiveness of actually providing contraceptives to adolescents, although his conclusion that their use should be encouraged suggests support for providing contraceptives to sexually active adolescents (107a).

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[85] It may seem to some that the use of contraceptives would be contrary to adolescents' adoption of "values," but if the goal is pregnancy prevention (and avoidance of other negative consequences of unprotected sexual intercourse), the use of contraception by those adolescents who are sexually active can be seen as responsible and health-promoting.

[86] Capacity-building includes imparting knowledge about human sexuality and contraceptive use and developing decisionmaking skills.

[87] Life option components include developing adolescents' *motivation* not to cut short their developmental trajectory by prematurely becoming pregnant and/or parents and helping adolescents to develop the *skills* to fulfill their (sometimes new-found) life ambitions.

Box 10-C—The Six General Conclusions of the National Academy of Sciences' Panel on Adolescent Pregnancy and Childbearing

On the basis of 2 years of review, analysis, and debate, the National Academy of Sciences Panel on Adolescent Pregnancy and Childbearing reached six general conclusions that underlie all of its specific conclusions and recommendations for policies and programs:

1. **Prevention of adolescent pregnancy should have the highest priority.** In both human and monetary terms, it is less costly to prevent pregnancy than to cope with its consequences; and it is less expensive to prevent a repeat pregnancy than to treat the compounded problems.

2. **Sexually active teenagers, both boys and girls, need the ability to avoid pregnancy and the motivation to do so.** Early, regular, and effective contraceptive use results in fewer unintended pregnancies. Delaying the initiation of sexual activity will also reduce the incidence of pregnancy, but we currently know very little about how to effectively discourage unmarried teenagers from initiating intercourse. Most young people do become sexually active during their teenage years. Therefore, making contraceptive methods available and accessible to those who are sexually active and encouraging them to diligently use these methods is the surest strategy for pregnancy prevention.

3. **Society must avoid treating adolescent pregnancy as a problem peculiar to teenage girls.** Our concept of the high-risk population must include boys. Their attitudes, motivations, and behavior are as central to the problems as those of their female partners, and they must also be central to the solutions.

4. **There is no single approach or quick fix to solving all the problems of early unintended pregnancy and childbearing.** We will continue to need a comprehensive array of policies and programs targeted to the special characteristics of communities and to the circumstances of teenagers from different social, cultural, and economic backgrounds and of different ages. Because adolescents are not a monolithic group, they do not all experience sexual activity, pregnancy, and childbearing in the same way. Our broad goal is the same for all young people: that they develop the necessary capabilities to make and carry out responsible decisions about their sexual and fertility behavior. The strategies for achieving these goals and the specific interventions to carry them out, however, should be sensitive to differences in values, attitudes, and experiences among individuals and groups.

5. **If tradeoffs are to be made in addressing the special needs of one group over another, priority should be given to those for whom the consequences of an early unintended pregnancy and birth are likely to be most severe: young adolescents and those from the most socially and economically disadvantaged backgrounds.** In many ways, those at highest risk are hardest to serve, yet they are also the groups that have been shown to benefit most.

6. **Responsibility for addressing the problems of adolescent pregnancy and childbearing should be shared among individuals, families, voluntary organizations, communities, and governments.** In the United States, we place a high priority on ensuring the rights of individuals to hold different values and the rights of families to raise their children according to their own beliefs. Therefore, public policies should affirm the role and responsibility of families to teach human values. Federal and State governments and community institutions should supplement rather than detract from that role.

SOURCE: National Academy of Sciences, National Research Council, Commission on Behavioral and Social Sciences and Education, Committee on Child Development Research and Public Policy, Panel on Adolescent Pregnancy and Childbearing, *Risking the Future: Adolescent Sexuality, Pregnancy, and Childbearing, Volume I*, C.D. Hayes (ed.) (Washington, DC: National Academy Press, 1987).

Thus, *a consensus is growing among scholars who have examined the pregnancy prevention literature that there is no "magic bullet" for preventing adolescent pregnancy.* Rather, a realistic approach that acknowledges that adolescents should be protected from the risks of unprotected sexual intercourse and at the same time strongly encouraged to delay the initiation of sexual intercourse seems essential. Short-term with a limited focus "programs"—e.g., didactic sexuality education interventions that seek to improve knowledge and foster health-promoting, responsible attitudes; life-skills decisionmaking interventions that teach adolescents how to deal with pressure to have sex or unprotected sex; and parent-child communication programs—do not appear to be able *on their own* to do very much about reducing the high incidence of adolescent pregnancy, although each of these program types shows some positive effects. One promising pregnancy prevention intervention was the South Carolina program that involved the provision of information *and* contraceptives, and involved parents, teachers, as well as adolescents as participants. This model did not include job and life skills training; other studies suggest that job and life skills training may be able to increase adolescents' motivation to avoid early pregnancy and childbearing.

The evidence on risk factors discussed above suggests that, as noted by the National Academy of Sciences panel, *different adolescents will have different needs, depending on their age, gender, socioeconomic status, cultural background, and community of residence*. Although more scientifically valid research is sorely needed, enough evidence exists to guide communities and national policymakers in their search for approaches that can lower adolescent pregnancy rates. Clearly, the figures presented earlier in this chapter (on increasing sexual experience rates among adolescents; apparent inconsistent use of contraceptives; persistently high adolescent pregnancy and birth rates; and clearly increasing levels of out-of-wedlock births) make an excellent case for ending the largely timid approach of the present. Finally, it may be important to go beyond "programs." Rather than simply being replicated in isolation, each of the successful interventions can be used to inform a general approach to working with adolescents.

Programs Designed To Prevent Negative Outcomes of Adolescent Pregnancy and Parenthood

Approximately one million U.S. adolescents become pregnant each year. Interventions to reduce the likelihood of negative outcomes of adolescent pregnancy and childbearing for the young female, her offspring, or her partner take four general approaches:

- providing pregnant adolescents with alternatives to parenthood by offering abortion or adoption services;
- ensuring that pregnant adolescents have adequate prenatal and other maternity care services[88];
- offering pregnant and parenting adolescents specific types of services that might help them (e.g., educational services or job training and employment services or social support services or housing, child care, or transportation)[89]; and
- providing pregnant or parenting adolescents with health and a wide range of other services in a comprehensive service program.

These approaches are discussed further below.

Programs That Offer Alternatives to Parenthood

Programs That Offer Abortions—For females who become pregnant and do not wish to become parents voluntary pregnancy termination by induced abortion became a nationally legal option following the U.S. Supreme Court's 1973 decision in *Roe* v. *Wade* [410 U.S. 113 (1973)].[90] Although this alternative is charged with controversy, especially for adolescents who are legal minors, in recent years it has been widely used by substantial numbers of adolescents who become pregnant, as was discussed earlier.

Legal abortions in the United States are performed in hospitals (as inpatient and outpatient procedures), in abortion and other clinics, and in private physicians' offices (79). The long-term trend as been away from the use of hospitals toward the use of abortion clinics and other nonhospital abortion providers (79). According to Henshaw and his colleagues at the Alan Guttmacher Institute, 86 percent of abortions in the United States in 1988 were performed in nonhospital facilities, including freestanding abortion clinics (64 percent of all abortions), other clinics such as surgicenters and family planning clinics (18 percent), and private doctors' offices (4 percent) (81b). The remainder (10 percent) were performed on either an inpatient or an outpatient basis in hospitals (81b).[91] Most facilities that perform abortions also provide preabortion sessions to provide information about the procedure and answer patients' questions, as well as contraceptive services and a postabortion checkup (78).

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[88] Prenatal care and health services intended to benefit infants and young children were discussed at length in OTA's 1988 report *Healthy Children: Investing in the Future* (199), so the primary focus in the discussion that follows will be on services intended primarily to benefit pregnant and parenting adolescents.

[89] Programs designed to enhance the social, emotional, and cognitive development of children born to adolescent mothers (e.g., parenting education programs) may have some benefits for the adolescents themselves. Because they are designed to benefit the children, however, such programs will not be discussed in detail here.

[90] For a discussion of U.S. Supreme Court decisions dealing with abortion, see ch. 17, "Consent and Confidentiality in Adolescent Health Care Decisionmaking," in Vol. III.

Several factors may limit adolescents' access to abortion, among them lack of abortion providers (or knowledge about abortion providers) in the community, parental consent and notification requirements, and cost. Abortion services are currently unavailable in many areas of the United States (79). Abortion services are most available in States on the East and West coasts (88). Abortion services are concentrated in metropolitan areas and are often not found in rural communities and small towns; in 1985, only 32,000 (2 percent) of the total number of abortions nationwide were performed outside of metropolitan areas (79). Another point is that fewer than half of all U.S. abortion providers perform abortions past the 12th week of pregnancy (79). A disproportionate number of women seeking second-trimester abortions are adolescents, and these adolescents may have particular difficulty obtaining abortions (79).

Several empirical studies concerning the impact of parental consent and notification requirements indicate that such requirements do create barriers to adolescents' access to and utilization of abortion services (e.g., 18a,18b,193c).[92] A number of States have passed laws requiring abortion facilities to obtain consent from one or both parents for legal minors who wish to obtain an abortion.[93] Furthermore, as discussed elsewhere in this Report, the Supreme Court's ruling in the 1989 case *Webster* v. *Reproductive* Health Services [109 S. Ct. 3040 (1989)] appears to give States greater leeway in restricting access to abortions and at the same time cast doubt on the future of *Roe* v. *Wade* and other Supreme Court decisions dealing with abortion. To the extent that *Webster* and future rulings increase States' ability to restrict abortion generally, they may reduce minors' access to abortion—even though the decisions do not directly address the question of parental consent. Also it should be noted that even if the laws do not *require* parental consent or notification, health care providers may as a matter of policy or practice refuse to provide services to minors without parental consent or notification. One reason for such a policy might be to ensure payment. According to the Alan Guttmacher Institute, 22 percent of all abortion clinics in 1981 required parental consent for most minors under most circumstances, especially for those under the age of 15 (78).

As of mid-1986, charges for a first-trimester nonhospital abortion ranged from $75 to $900 (79). For adolescents from low-income families, adolescents who lack health insurance, and adolescents whose health insurance does not cover abortions except in the narrowest of circumstances, the cost of an abortion may be a barrier to access. At least eight States (Idaho, Kentucky, Minnesota, Missouri, Nebraska, North Dakota, Pennsylvania, and Rhode Island) have mandated some restrictions on private health insurance for abortions (76a).[94] Federal funding of abortions through Medicaid has been prohibited since 1977 (81a), and only a minority of State have used their own moneys to fund abortions for low-income women (79).

In 1988, DHHS issued new regluations under Title X of the Public Health Service Act prohibiting Title X family planning clinics from providing abortion counseling or abortion referrals to pregnant women. To the extent that the regulation is enforced, it is likely to have an adverse effect on adolescents' access to abortions.[95]

Programs That Offer Adoption Services—Some adolescent females carry their pregnancies to term because they do not have access to abortion services, do not consider abortion an acceptable alternative, or become aware of their pregnancy beyond the point at which they can have an abortion, and feel they are not prepared for parenthood. For these adolescents, services to help plan for adoption or assist in the process of having the child adopted may be important.

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[91] Prior to 1983, hospitals were more likely than facilities to provide later stage abortions, but a 1983 U.S. Supreme Court ruling determined that States may not require hospitals to perform early second-trimester abortions [(*City of Akron* v. *Akron Center for Reproductive Health*, 462 U.S. 416 (1973)]. This ruling, combined with the fact that clinic-based abortions are substantially less expensive than those performed in hospitals, has led to growth in the number of clinics providing abortions and a simultaneous decline in the number of hospitals performing this service (79,81b).

[92] Other studies are noted in ch. 17, ''Consent and confidentiality in Adolescent Health Care Decisionmaking,'' in Vol. III.

[93] For further discussion of State statutes dealing with abortion and the impact of parental consent and notification requirements or access to services, see ch. 17, ''Consent and Confidentiality in Adolescent Health Care Decisionmaking,'' in Vol. III.

[94] For further discussion, see ch. 16, ''Financial Access to Health Services,'' in Vol. III.

[95] Current limitations on the use of Federal Medicaid, Title X, and Title XX funds to pay for abortions, abortion referrals, and abortion counseling are discussed below in the section of this chapter entitled ''Federal Programs and Policies Pertaining to Adolescent Pregnancy and Parenting.''

Although several studies of adoption decisions and the decisionmaking process have been conducted in recent years (12,133), relatively little information is available on the extent and nature of services provided for adolescents considering adoption (88). Adoption services may include education and counseling for the adolescent, identification and selection of adoptive families, and legal services related to carrying out the adoption decision (148). When such services are provided in a residential program, they are usually part of a comprehensive package (146). Typically, however, multiple agencies, including public and private adoption agencies, are involved in providing the range of services needed by adolescents considering giving a baby up for adoption.

According to the National Academy of Sciences, less than 10 percent of all U.S. adolescents who become pregnant choose adoption (148). In a 1986 survey of services to pregnant and parenting adolescents offered by member agencies of the Child Welfare League of America (CWLA), 63 percent of the 121 agencies surveyed indicated that they made adoptive placement available to their female adolescent clients (211). In contrast, almost all (97 percent) of the CWLA agencies who responded to a similar survey in 1969 offered adoptive placement services (186). Fairly few of the agencies surveyed in the 1986 survey indicated that adoption services were in demand among their clients; only 26 percent of the agencies named adoption in listing the five services they provided which were most often used by young women (there were no similar data from the 1969 study).

One Federal program that supports adoption as an alternative to abortion among adolescents is the Adolescent Family Life (AFL) program authorized under Title XX of the Public Health Service Act. Federal assistance for adoption is also provided under Title IV-E of the Social Security Act.[96]

Programs That Offer Maternity Care or Family Planning Services

Programs That Offer Maternity Care—As noted earlier, the standards of maternity care developed by the American College of Obstetricians and Gynecologists recommended that every pregnant woman have a comprehensive program of prenatal care beginning as early in the first trimester of pregnancy as possible (9a,148). A recognition that pregnant adolescents, especially low-income and minority adolescents, may be at high risk of receiving inadequate prenatal care, and therefore at risk of poor pregnancy outcomes, has led to various efforts intended to increase the quality and amount of prenatal care that pregnant adolescents receive.

Programs to help high-risk adolescents obtain adequate prenatal care have been initiated by public health departments, university hospitals, freestanding clinics, youth service agencies, school-linked health centers (SLHCs),[97] and by private physicians (148). These providers offer services that include pregnancy testing and counseling; testing for STDs; regular medical examinations to monitor the course of the pregnancy; health and nutrition education and referral for nutrition services (e.g. those provided through the U.S. Department of Agriculture's Special Supplemental Food Program for Women, Infants, and Children); and delivery and postpartum care services. Many programs have included intensive outreach components and provide transportation to clinic sites in areas where public transportation is inadequate or unavailable (147). Others have offered counseling, referral, and educational services through home visits by professional health care providers or trained paraprofessionals, combined with clinic visits for medical care. The services may be provided in a separate program or may be included as part of a comprehensive package of services to pregnant and parenting adolescents (150a).

One of the factors influencing adolescents' use of prenatal and other maternity care is the availability of health insurance coverage. Private health insurance provides maternity care coverage for women at all income levels. Since the enactment by Congress of the Pregnancy Discrimination Act of 1978 (Public

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[96] The Title XX AFL program is discussed later in this chapter along with other Federal programs related to adolescent pregnancy and parenting.

[97] For discussion of services offered by SLHCs, see ch. 15, "Major Issues Pertaining to the Delivery of Health and Related Services to Adolescents," in Vol. III.

Law 95-555), almost all employment-based health plans covering 15 or more employees provide maternity care benefits (76b). Because of a loophole in the regulations issued under that act, however, about one-third of privately insured adolescents are not covered for maternity benefits by their parents' employment based health plan.[98]

Medicaid is the major public financing program for pregnant women who are poor. The Omnibus Budget Reconciliation Act of 1989 (Public Law 101-239) required that, as of April 1, 1990, States provide Medicaid coverage to all pregnant women and children up to age 6 with family incomes up to 133 percent of the poverty level. Even women who are eligible for Medicaid, however, may encounter barriers (e.g., low Medicaid participation rates among physicians due to low reimbursement rates or onerous administrative procedures) to the timely receipt of care.[99]

Two major financing alternatives to health insurance coverage for maternity care are the Maternal and Child Health Block Grant Program authorized by Title V of the Social Security Act and community and migrant health centers (199). As discussed later in this chapter, little is known about who receives what services under the Title V maternal and child health block grant. Community health centers provide "primary health services" to residents of medically underserved areas, about half of whom lack health insurance.[100]

Programs That Offer Family Planning Services To Prevent Repeat Pregnancies—Females who have a first pregnancy during their adolescent years are at high risk of having repeat pregnancies. As noted earlier, Furstenberg and colleagues found that adolescent mothers who gave birth to additional children in the years immediately after the birth of their first child did not achieve as well vocationally as the mothers who had controlled their fertility (68a). Making family planning services available to young mothers following the birth of their first child may help to delay a second pregnancy for up to a year; few long-term effects on pregnancy rates have been demonstrated (86).

Programs That Offer Specific Types of Services to Pregnant Adolescents and Adolescent Mothers

School-Based Programs—Because of the strong relationship between the educational attainment of young mothers and their economic self-sufficiency, many programs serving pregnant adolescents or adolescent mothers have focused on the adolescents' educational needs. Title IX of the Education Amendments of 1972 prohibits discrimination in education against teens because of their pregnancy/childbearing/marital status (88). In the late 1970s and early 1980s, teens who gave birth were less likely to leave school than in the late 1960s and early 1970s (88).

Regular school routines, regulations, and facilities are seldom able to accommodate all of the special needs of pregnant adolescents or adolescent mothers (e.g., their need for flexible schedules, child care, and specialized health education, and in some cases, parent training). In order to help meet these needs, at least some school systems have established alternative schools for pregnant adolescents and adolescent mothers (148). Some of these alternative schools are located within existing secondary schools, facilities, and others are in facilities of their own. Most of the alternative schools are self-contained. Alternative school programs typically offer pregnant and parenting adolescents individually paced academic instruction. In addition, many programs provide special instruction in sex education, health and hygiene, nutrition education, parenting skills training, life planning, life skills training, and job training (148). Most of them also provide onsite child care. Alternative schools for pregnant and parenting adolescent mothers frequently help link their students to other programs both within the school system and in the larger community (e.g., family planning, income supports, housing).

School-based interventions for pregnant adolescents and adolescent mothers vary widely in intensity, duration, and scope. Intensive, comprehensive educational programs offered both during and after pregnancy may be able to increase the likelihood that pregnant adolescents will stay in school and that adolescent mothers will complete high school (230).

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[98] For further discussion, see ch. 16, "Financial Access to Health Services," in Vol. III.

[99] The problem of low Medicaid participation by obstetricians is discussed in ch. 16, "Financial Access to Health Services," in Vol. III. This and other barriers to the timely receipt of maternity care by poor women eligible for Medicaid were discussed at greater length in OTA's 1988 report *Healthy Children: Investing in the Future* (199).

[100] For discussion of the Title V Maternal and Child Health Block Grant Program and community health centers, see the section on Federal programs related to adolescent pregnancy and parenting below.

Unfortunately, well-controlled studies of the impact of alternative school programs on adolescent mothers' educational attainment do not exist (115,172). There is some evidence, however, that alternative school programs are able to increase participants' educational aspirations, enhance their knowledge of positive health practices and parenting skills, and improve health-related outcomes for both mothers and their infants (121).

It is important to note that school-based programs for pregnant and parenting adolescents serve only adolescents who remain in school after they become pregnant; few programs conduct active outreach to identify adolescents who are no longer in school when they become pregnant, and some do not follow up on adolescents who drop out during the course of their pregnancies (172). Thus, school-based programs for pregnant and parenting adolescents may be serving only the best informed, most highly motivated adolescents. There is also some concern that in areas where school officials lack commitment to or actively resist alternative programs, such programs may serve to exclude pregnant and parenting adolescents from regular school settings and may not provide them with an education that is comparable with that of their nonparenting peers (2,230).

Employment and Job Training Programs—As noted earlier, early parenthood may adversely affect adolescents' job opportunities and ability to achieve economic self-sufficiency. For that reason, increasing attention has been paid to the needs of pregnant and parenting adolescents for job training and job placement services, especially for older adolescents. In some comprehensive care programs for pregnant and parenting adolescents, however, including employment as a goal has been controversial because of the concerns that an emphasis on employment as a goal may lower the educational attainment of younger adolescents who have not yet completed high school (148).

As discussed elsewhere in this Report, the U.S. Department of Labor supports training and employment programs for economically disadvantaged youth ages 16 and over under the 1982 Job Training Partnership Act. This act authorizes the Job Corps and various other programs affecting adolescents.[101] Few of the large *federally supported youth employment programs* have been sensitive to the special needs of pregnant and parenting adolescents (e.g., their need for child care) (148). Such programs have not had much effect on young mothers' employment status or earning levels. Even programs that have targeted adolescent parents seem to have shown little impact on participants' employment rates (26), although some programs have been able to increase participants' work preparedness and actual work experience (148).

A program called *Teenage Parent Demonstration*, sponsored by the Office of Family Assistance in the Family Support Administration of DHHS, is currently operating in Illinois and New Jersey in three different sites (131). This program serves urban, low-income, largely minority adolescent parents who are receiving AFDC benefits, with the goal of reducing long-term welfare dependency among them. Case managers assist program participants in identifying and fulfilling educational or employment-related experiences, and they provide referral services to community resources. The program also offers assistance with child care and transportation to help adolescents adhere to their plans. In an attempt to enhance the long-term ability of fathers to make support payments, efforts are being made to establish paternity soon after the birth of the baby, and the fathers of the participant's children are eligible to receive employment-related training. The Teenage Parent Demonstration is being evaluated for the effects of program participation on the adolescent parents' prospects for self-sufficiency by Mathematica Policy Research Inc., which will obtain State and county agency records, program records data, and followup interviews and basic skills tests with experimental and control groups. The program is still being implemented, so data are not yet available.

Programs That Provide Social and Emotional Support—In the 1986 survey of services to pregnant and parenting adolescents offered by member agencies of the CWLA, individual counseling was mentioned by almost four-fifths (79 percent) of the responding agencies as a "most often used" service by pregnant and parenting adolescents (both males and females) (211). To some extent, this finding may reflect the nature of the agencies surveyed (which were mostly child welfare and family service agencies, both public and private), but it also suggests that the provision of social support services may be an important component of interventions for pregnant and parenting adolescents.[102]

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[101] A 1978 evaluation of the Job Corps program reviewed earlier in this chapter found that participation in the program seemed to delay family formation and reduce the incidence of out-of-wedlock childbearing among participants (210). For further discussion of the Job Corps and other youth training and employment programs administered by the U.S. Department of Labor, see ch. 19, "The Role of Federal Agencies in Adolescent Health," in Vol. III.

In addition to providing counseling, several programs link pregnant adolescents and adolescent mothers with adult or peer mentors or role models. These programs frequently target young women who are no longer living with their families of origin. Many have made use of community women volunteers or older adolescent mothers who provide advocacy for needed services, practical assistance, and reinforcement of positive messages related to prenatal and postnatal care, continuing in school, and effective contraceptive use. Such services may be offered as part of a larger program (170) or may exist as a separate intervention (155).

Unfortunately, interventions that focus on providing social and emotional support to pregnant and parenting adolescents have not been evaluated separately for their impact on such outcomes as educational attainment, job status, subsequent childbearing, or health status of mothers or infants (148). It is reasonable to expect, however, that the quality of the training and supervision that role models and mentors themselves receive will affect the ability of mentoring efforts to influence desired program outcomes, as will the quality of the mentoring relationship (148). In one comprehensive intervention for pregnant and parenting adolescents (Project Redirection, described below), the mentoring component affected program attrition, with those who were dissatisfied with their community mentors citing this as a reason for their dissatisfaction with the program (170). Thus, while it may be important to offer social support to pregnant adolescents and adolescent parents, particularly those who are alienated from their own families, further information is needed about the potential for role modeling and mentoring approaches to provide this service.

Programs That Provide Housing, Child Care, or Transportation Services—Although many pregnant and parenting adolescents are able to live with their families of origin or with their partners' families, and others have the resources to establish independent living, finding adequate housing is a problem for a significant minority of pregnant and parenting adolescents, especially those who are minors (24). *Residential programs* for both pregnant adolescents and adolescent mothers, after experiencing a decline during the past 3 decades, have apparently been increasing in number in recent years, but the number is still small. According to William Pierce, president of the National Committee for Adoption, in 1980 there were only 99 homes for pregnant adolescents, but in 1989 there were about 140 homes serving about 2,600 adolescents (75). Some of these homes have been sponsored by antiabortion groups in response to criticisms that young women were being admonished to continue their pregnancies and choose adoption without being given resources to enable them to carry healthy pregnancies to term (75). Others, such as the Florence Crittenton agencies, have had a longstanding emphasis on preparing young mothers and their children for independent living and have tended not to support adoption (132).

Some residential programs for unwed pregnant adolescents exist primarily to offer housing and auxiliary services until a young woman gives birth; 33 percent of the CWLA agencies surveyed in 1986 offered prebirth residential or group home care in 1986 (211). Other programs continue to provide housing and other services after the birth of the child, although such services are less common; only 18 percent of CWLA agencies offered postbirth residential care in 1986 (211).

Adequate *child care*, especially infant care, is another service that is crucial for adolescent mothers who are enrolled in school, involved in job training, or working to support themselves (23,36). The inability to obtain child care is the single most commonly cited reason young mothers give for not returning to school following the birth of their child (49,216). However, some school-based programs for adolescent mothers do provide child care on-site, and some adolescents are able to make private child care arrangements, usually with family members. Less than half (47 percent) of the CWLA agencies surveyed in 1986 stated that they provided child care (211).

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[102] This idea is supported by the results of the Teen Father Collaboration (discussed later), which indicated that counseling was the single most utilized service by the adolescent fathers involved in the project (177).

Transportation, especially to school or child care facilities, and especially in communities with limited (or no) public transportation, is also essential for many parenting adolescents. In most communities, school buses are not able to carry infants and toddlers for safety reasons (35). Thus, specially equipped vans or buses may be needed to transport adolescent mothers enrolled in school or employment programs. However, transportation services are not commonly offered to pregnant and parenting adolescents; a study published in 1984 found that only 29 percent of the pregnant teens and 14 percent of the teen mothers involved in programs funded by the Office of Adolescent Pregnancy Prevention in the Office of Population Affairs of DHHS benefited from transportation assistance (26). Although approximately three-fifths of the CWLA agencies surveyed in 1986 stated that they offered transportation services, less than one-fifth saw this assistance as necessary; perhaps as a result, transportation was a frequently used service by clients in less than 10 percent of the CWLA agencies (211).

Although support services such as housing, child care, and transportation are frequently cited as essential adjuncts to the success of many interventions for pregnant and parenting adolescents (24,35), little information is available on their impact on program goals and outcomes. Nevertheless, there are some data that do support assertions regarding the importance of including support components in comprehensive service programs. A study of Office of Adolescent Pregnancy Prevention programs, for example, found that receipt of child care reduced the likelihood of a repeat pregnancy by 1 full year among adolescents who were pregnant at entry into the programs; adolescents receiving child care who were already mothers at entry were more likely than those who did not receive child care to have completed more schooling or to be employed 1 year later (26). The same study found that pregnant adolescents who received transportation assistance through Office of Adolescent Pregnancy Prevention projects were more likely to be still enrolled in school at the time they delivered than were other participants who did not receive transportation services (26). A 1987 study of programs for pregnant and parenting adolescents supported by the California Department of Education found that when transportation services were cut, program attendance declined (27). Thus, although the data are limited, they strongly suggest that such support services may be integral to the ultimate success of interventions for pregnant and parenting adolescents.

Programs That Offer Comprehensive Services to Pregnant Adolescents and Adolescent Mothers

Over the past decade, there has been growing awareness that most pregnant and parenting adolescents are not well-served by a fragmented service delivery system designed to deal separately with needs for health care, educational services, economic assistance, and psychosocial support services. Consequently, efforts have been made to establish comprehensive programs able to provide pregnant and parenting adolescents with multiple services either during pregnancy or through the first year or two of parenthood.

Comprehensive programs for pregnant or parenting adolescent females typically provide education, health care, employment, and social services. The services may either be provided by one agency or provided through several different agencies with formal or informal agreements, often using a case management approach (24).

The *Teenage Pregnancy and Parenting Program (TAPP)* in San Francisco is one example of the comprehensive services model. This program, which is coordinated by the Family Service Agency of San Francisco and the San Francisco Unified School District, involves over 30 agencies in providing health, education, and social services to pregnant adolescents. Staff from a number of different agencies are located at TAPP sites, and TAPP staff serve as liaisons in other agencies that see large numbers of pregnant and parenting adolescents (e.g., a hospital-based clinic, a maternity home, an SLHC). Each pregnant adolescent client is assigned a "continuous counselor" who provides case management; an alternative school, child care, and health care services are provided on-site at TAPP, and transportation assistance for the public transit system is available to clients (191). An evaluation of TAPP found successful outcomes in terms of school attendance and avoidance of repeat pregnancies (23a,47a).

Another example of the comprehensive services model is *Project Redirection*, which was established to help low-income young mothers and pregnant adolescents who had not completed school (217). Project Redirection was initially implemented in

Photo credit: Katherine Criss, New York, NY

The report *One-Stop Shopping: The Road to Healthy Mothers and Children*, by the bipartisan National Commission To Prevent Infant Mortality, noted the current level of fragmentation among services for pregnant and parenting women, including adolescents. It found that the current consensus is that a comprehensive range of services should be provided, optimally in a single setting.

four sites nationwide with funding from the Ford Foundation and the U.S. Department of Labor. These four sites provided low-income young mothers and pregnant adolescents with educational and employment counseling, parenting education and life skills training, transportation, child care, and referral to health services. Because of its initial success in terms of welfare reductions, employment, and improved parenting skills, Project Redirection was expanded to an additional seven sites (169). Each program participant was assigned to a female community volunteer, who provided social support, practical assistance, and linkage between the program and the participant (170).

Project Redirection, which emphasized education and the development of job skills, had little effect on participants' pregnancy rates, contraceptive use, or repeat pregnancy rates, but it decreased the number of abortions among program participants[103] and increased participants' rates of school retention and completion, levels of employment, and parenting ability; it also improved the cognitive skills of participants' children (169) and reduced the number of behavioral problems among children (67,170). Further, these advantages were maintained 5 years after enrollment in the Project Redirection program (67,169,170).

However, the final report on Project Redirection notes that, despite impressive gains for many individuals, the program should not be considered a panacea (169). At the close of the project, the majority of participating adolescent mothers had still not received their diplomas or passed the tests of general educational development (GED); were not working despite their desire to do so; had received AFDC at some point during the previous 12 months; and were living in poverty (169). One observation made by the researchers was that the participants' serious educational needs were probably not adequately met by the program, because educational services were not tailored to the participants' needs and because they were delivered off-site (169). Clearly, educational deficits can have a great deal to do with employability and poverty levels.

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[103] The final report on Project Redirection notes the possible interaction between the program's success with parenting education and relative "failure" with pregnancy and birth rates (169). According to Polit and her colleagues, "An environment that encouraged nurturing and vigilant maternal behavior, in which babies were given a lot of love and attention, could well have dampened interest in terminating [or otherwise reducing] unintended pregnancies" (169). The lesson to be drawn, according to the researchers, is not that the parenting education component of the program should be discarded or minimized (it apparently was responsible for the beneficial effects on the children of participating mothers), but that the family planning aspects (which were actually delivered off-site and implemented in a "fairly low-key" fashion) should be strengthened (169).

Drawing on the lessons of Project Redirection, Manpower Demonstration Research Corporation designed *New Chance*, a program for adolescent mothers begun in 1989 (126a). New Chance emphasizes integration of services, onsite provision of services, longer duration of services, greater intensity of services, greater obligations on the part of enrollees to participate regularly, comprehensiveness (educational development, employability development, personal and social development, health services, and services for participants' children), and an experimental evaluation design (126a). New Chance will not target adolescents younger than 17 (126a).

According to the National Academy of Sciences' Panel on Adolescent Pregnancy and Childbearing, the available evidence suggests that it may be important for comprehensive service programs for pregnant and parenting adolescents to take into account the age of the adolescents they serve, since the needs of younger adolescents and adolescents who remain in their families of origin may differ from the needs of older adolescents who are no longer in school or who are living independently (148). Also, as noted by Polit and her colleagues, because many comprehensive programs rely on other agencies to provide some of the services needed by their adolescent clients, the impact of these programs is likely to depend heavily on the availability and quality of brokered services. Indeed, one study of comprehensive care programs for pregnant and parenting adolescents concluded that most organizations offering these programs were not able to meet their goals because of a lack of resources, community support, problems in interagency collaboration, or a lack of adequate mechanisms for coordinating services to pregnant and parenting adolescents (218). Hofferth concluded that the comprehensive services model holds promise for improving outcomes for pregnant and parenting adolescents, but it appears that services must be truly comprehensive, client-focused, and intensive to be effective (86).

Programs for Adolescent Fathers

Along with the increasing recognition of the importance of involving young men in pregnancy prevention efforts has come greater interest in including adolescent and young adult fathers in the provision of services. Some concerns about the adolescent and young adult fathers of children born to adolescent mothers have centered less on the welfare of the fathers, however, than on the fathers' limited ability to behave "responsibly" toward the family they have helped to create (i.e., by providing financial support) and have tended to focus on issues of establishing paternity and child support (1). Adolescent and young adult fathers have been included in many youth employment and job training programs, but such programs typically have paid little attention to their status as parents and make little effort to adapt program services to their parental roles (148).

This isn't the convertible he was saving for.
Make a baby–make a lifetime commitment.

Photo credit: The North Carolina Coalition on Adolescent Pregnancy

Adolescent females have traditionally been the target group for special services for adolescent parents and their children. Over the last decade, however, several comprehensive service programs for adolescent fathers have been established. The programs for fathers are generally intended to improve adolescent fathers' ability to support their children and to improve their ability to be good parents.

Over the last decade, however, several comprehensive service programs for adolescent fathers have been established. These comprehensive service programs for adolescent fathers operate through a variety of organizations (e.g., existing adolescent pregnancy programs for young women, schools, community service agencies). The programs are generally intended to improve adolescent fathers' ability to support their children and to improve their parenting skills, and provide a variety of services, including education (dropout prevention, remedial education, or GED classes), employment and employability services (e.g., job training, job counseling, and vocational education), individual counseling, parenting skills training, and legal representation and advocacy for paternity establishment and child support issues (1a,99).

The *Teen Father Collaboration*, a national demonstration project initiated and supported by the Ford Foundation, has been a model for comprehensive service programs designed for adolescent fathers (and the only adolescent fathers' project with systematic evaluation data) (116). Eight sites were selected to extend existing service programs for adolescent mothers to include adolescent fathers. Outreach strategies, types of services offered, and locations of service provision varied from site to site; local agencies were not expected to implement and test any particular model of service delivery, nor were any adolescent fathers placed in a comparison group receiving no or different services (178). Instead, each agency had to struggle to understand and meet the needs of its own local population of adolescent fathers. Evaluation of the results of the project were also limited by the facts that the adolescent fathers who took part were entirely self-selected, and that there was a high attrition rate (178); thus, any findings should be viewed cautiously. An evaluation component found that, overall, nearly half of the adolescent fathers not enrolled in school at the beginning of the project (and for whom outcome data were available) returned to school or began a GED program subsequent to their participation; over 60 percent of the adolescent fathers who had been unemployed at the start of the project were able to get a job and provide financial support (as well as in-kind contributions and emotional support) to their partners and children, and over 80 percent of participating fathers had daily contact with their children (178).

Public/Private Ventures has begun a program similar in some respects to the Teen Father Collaboration called the *Young Unwed Fathers Project* (169b). The purpose of the project is to help local agencies respond to the mandate of the Family Support Act of 1988 (Public Law 100-485) that, effective October 1990, welfare agencies require adolescent fathers to contribute to the support of their children (169b). As Public/Private Ventures notes, the Family Support Act's mandate is only one part of the story: "Enabling the young men to fulfill their obligations is the job of other agencies in the community" (169b).

The Young Unwed Fathers Project is designed to demonstrate how the needed agency connections can be made, and how the enabling services can be delivered effectively (169b). Six communities were selected to test a variety of paths toward providing unwed adolescent fathers with training and jobs at a wage level equal to meeting family responsibilities, and education for and support in the fathering role. The young men in each program will be enrolled for up to 1 year, with followup counseling and support for an additional 6 months. The demonstration project's research questions include: "Which program strategies, involving which agencies, best attract, retain, and produce positive effects on the young men? What are the effects? And is cost a factor in the program components that produce outcome variations?" (169b).

Conclusions About the Effectiveness of Programs To Prevent Negative Outcomes of Adolescent Pregnancy and Parenthood

Although national statistics on adolescent births do not readily provide information on the socioeconomic status of the adolescents (e.g., 207b), other information clearly indicates that becoming a mother places an adolescent and her child in a precarious situation in terms of immediate socioeconomic status and both the mother's and child's future (70,148,195a). One of the most definitive lessons to be learned from interventions that have attempted to improve the lives of adolescent mothers and their children is that such mothers and children typically have need for an extraordinary range of support and services. These services can include income support, health services, further education, employability training, job skills, transportation, housing, parenting education, social support, and child care (e.g., 169). It is for just this reason that many have suggested that, when thinking of interventions dealing with adolescent pregnancy and childbearing, pregnancy *prevention* be made the highest priority (148).

Adolescent fathers are a less visible part of the picture and have received less programmatic attention than adolescent mothers. Available data suggest that they too often have serious needs for a range of remedial services (e.g., 195a).

That there are now several model programs for the provision of a comprehensive range of services to pregnant and parenting adolescents and their children (e.g., 47a,150a,169a) should not disguise the fact that it is more than likely that many pregnant and parenting adolescents will face serious barriers to getting the services they need (150a). Typically, model and demonstration programs are only that: models for what could be, rather than illustrations of strategies that serve all or most of those in need.

In its review of services for pregnant and parenting women and their children, the bipartisan National Commission To Prevent Infant Mortality found that many needy pregnant women and their children face numerous "roadblocks" to receiving care (see box 10-D). As an example of what can befall a particular woman, the commission provided the following case study (150a):

> In January 1988, Jolene wasn't feeling well and wanted a pregnancy test. However, because the local public health clinic only offered tests on certain days of the week which were inconvenient for her, she went to a local Planned Parenthood. After learning she was pregnant, Jolene began seeking out services. Her first stop was at the Food Stamp office. While there, she learned about AFDC benefits and was referred to another service center to apply for them and for Medicaid.
>
> She next went to the community Women's Center for prenatal care, only to be told to return in two weeks for an eligibility determination appointment. When she did, she was referred to the Central Clinic downtown to apply for WIC services and to University Hospital to establish hospitalization eligibility. She was finally given an appointment for three weeks later at the Women's Center, and was told to go back to the downtown Central Clinic for an HIV test.
>
> After giving birth, Jolene returned for family planning services, but found that they were only provided 2 days per week. All told, Jolene made nine trips in 6 weeks to begin care and receive Medicaid eligibility.

This case study does not address multiple other needs that a "Jolene" may have had: for housing, child care, education, parent skills training, job training, employment, and transportation (see box 10-A earlier in this chapter). Neither does it address the needs of the father of "Jolene's" baby.

Box 10-D—Roadblocks to the Provision and Coordination of Care for Pregnant and Parenting Women and Children: Findings of the National Commission To Prevent Infant Mortality

According to the National Commission To Prevent Infant Mortality, there are numerous roadblocks to the provision of care for pregnant and parenting women and their children.

Roadblocks to the provision of care:

- Lack of Medicaid coverage;
- Insufficient physicians, certified nurse-midwives, or nurse practitioners in the clinic or the community—especially true of rural and inner-city areas;
- Physicians who refuse to accept Medicaid, or who have dropped their obstetrical practice because of the high cost of malpractice insurance;
- Lack of treatment programs for substance-abusing pregnant women and mothers;
- Lack of transportation;
- Lack of child care;
- Inconvenient service hours;
- Language and cultural barriers;
- Fragmentation of programs and services such as Medicaid, the Special Supplemental Food Program for Women, Infants, and Children (WIC), housing assistance, and other programs.

Roadblocks to the coordination of care:

- The fact that Federal, State, and local governments typically respond to one health or social crisis at a time;
- Increases in the numbers of programs and the size of government, resulting in "vertical fragmentation";
- Fragmentation between administrating agencies and service providers (so-called "horizontal fragmentation");
- Multiple funding streams;
- Different definitions, terminology, and factors for determining eligibility and benefits.

SOURCE: National Commission To Prevent Infant Mortality, *One-Stop Shopping: The Road to Healthy Mothers and Children* (Washington, DC: April 1991).

A major point made by the National Commission To Prevent Infant Mortality and other observers is that programs should be designed around the needs and characteristics of the clients, rather than around the habits and traditional orientations of the providers (150a).

OTA suggests that, in addition to the barriers listed in box 10-D, a reason that comprehensive, integrated services may not have been implemented is that they appear to be expensive. It is encouraging that organizations such as Public/Private Ventures are beginning to include examination of program costs in some of their demonstration projects (169b). In order to advance the case for comprehensive, integrated services for pregnant and parenting adolescents, it may be necessary to demonstrate (if such is the case) that such programs are cost-effective in comparison to most currently available alternatives.

Major Federal Programs and Policies Pertaining to Adolescent Pregnancy and Parenting

A number of Federal health, educational, and human services programs offer services that may either help prevent adolescent pregnancy or may affect the outcome of adolescent pregnancy. These include the Title X Family Planning Program and the Title XX Adolescent Family Life (AFL) Program under the Public Health Service Act (see table 10-10). Title X and Title XX are discussed further below.

Also discussed briefly below are various other health benefit, income support, education, training, and food and nutrition programs that are relevant to adolescents who are at risk of pregnancy or are pregnant or parenting (160).[104] In many cases, there are few data on the use of these other programs by adolescents.[105] A recent review concluded that there are essentially no Federal programs specifically designed to ameliorate the long-term consequences of adolescent pregnancy and childbearing (196).

The Title X Family Planning Services and Research Program

Title X of the Public Health Service Act was established by the Family Planning Services and Population Research Act of 1970 (Public Law 91-572). At the Federal level, it is administered by the Office of Population Affairs in DHHS. As shown in table 10-10, Title X provides Federal grants to public and nonprofit entities that operate family planning clinics for predominantly low-income women (including adolescents) in need of subsidized family planning services; it also supports family planning research, training, and information and educational activities. The Title X program is the major source of Federal funding ($130 million appropriation in fiscal year 1990) for public and private nonprofit family planning clinics that offer contraceptive and other services (e.g., screening for STDs, pregnancy testing and counseling, and sometimes prenatal care) to predominantly low-income clients.[106] Furthermore, it is the only Federal program designed *specifically* to provide family planning services.

During the 1970s, the appropriation for the Title X program increased steadily, peaking in 1981 at at $161 million. Since 1982, the appropriation has not exceeded $140 million. Furthermore, the Title X family planning program has not been formally reauthorized by Congress since the end of fiscal year 1985. Instead, it has been reauthorized through the appropriations process via continuing resolutions (196,197). In 1988, Congress appropriated $138.3 million for Title X, and in 1990, it appropriated $130 million. For fiscal year 1991, the administration requested $139 million for the family planning program (197). As in previous years, the budget request assumed enactment of the administration's proposal to recast the Title X into an authority for block grants for State family planning programs (197).

Title X Family Planning Clinics—Title X grantees (including public and private nonprofit entities such as county health departments, Planned Parenthood affiliates, and hospital outpatient departments) operate some 4,000 family planning clinics across the country. In fiscal year 1989, clinics that received Title X funds served more than 4.3 million clients (predominantly low-income females), including 1.4

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[104] For further discussion of these programs, see J.G. Dryfoos, *Adolescents at Risk* (47a).

[105] See ch. 19, "The Role of Federal Agencies in Adolescent Health," in Vol. III for a general discussion of Federal programs related to adolescent health.

[106] Federal funding for family planning services also comes primarily from three other sources: the social services block grant (Title XX of the Social Security Act), Medicaid (Title XIX of the Social Security Act), and the maternal and child health block grant (Title V of the Social Security Act) (74c). These programs are discussed below.

Table 10-10—Overview of Title X and Title XX of the Public Health Service Act[a]

Program	Purpose	Priorities	Funding level	Total adolescents served in a year
Title X of the Public Health Service Act (Family Planning Services and Research Act of 1970)	To provide grants for entities that operate approximately 4,000 public or private nonprofit family planning clinics across the country. Also to fund training for personnel to improve the delivery of family planning services; to promote service delivery improvement through research on family planning and population issues; and to develop and distribute information on family planning.	Clinics that receive Title X money are supposed to offer a broad range of family planning methods and services.[b] Priority for clinic services is given to low-income clients. In fiscal year 1987, national priority areas for service grants were family involvement of Title X adolescent clients, infertility services, natural family planning services, male involvement, sexually transmitted diseases, AIDS, adolescent abstinence from sexual intercourse, and regionally identified areas of concern.	$130 million appropriation in fiscal year 1990. Since about one-third of the Title X clients are adolescents, about one-third of this ($43 million) funding is used for adolescents.	Of the estimated 4.3 million predominantly female clients served annually by Title X clinics, about one-third (1.4 million) of whom are adolescents ages 15 through 19.
Title XX of the Public Health Service Act (Adolescent Family Life Program)	To provide grants for: 1) demonstration projects that seek to prevent adolescent pregnancy by encouraging adolescents to abstain from premarital sexual activity,[c] and 2) demonstration projects that provide care services for pregnant or parenting adolescents.[d] Also to support research on the societal causes and consequences of adolescent pregnancy, and childrearings to support evaluative research to identify effective services; and to disseminate results of research projects.	One-third of Title XX funds goes to demonstration projects for adolescent pregnancy prevention that primarily encourage sexual abstinence; two-thirds goes to demonstration projects that provide innovative approaches to the delivery of care services for pregnant and parenting adolescents. Priority is given to grant applicants who serve areas with a high incidence of adolescent pregnancy, serve areas with a high proportion of low-income families.	$9.5 million annual appropriations for 1990 through 1992. All Title XX funding is for adolescents under age 19.	Pregnancy prevention projects in 1982: 54,000 females and 48,000 males. Projects that provide care services to pregnant or parenting adolescents in 1986: 10,728 females and 3,387 male partners.

[a] Title X and Title XX of the Public Health Service Act are both administered by the Office of Population Affairs within the U.S. Department of Health and Human Services (DHHS).

[b] Family planning services provided by Title X clinics include a broad range of contraceptive methods, screening for sexually transmitted diseases (STDs), infertility services, and natural family planning. The use of Title X funds for abortion as a method of family planning has been prohibited by statute and regulations since the enactment of the Title X program. For its first 17 years, Title X program was administered under regulations that required employees of clinics receiving Title X money to provide nondirective counseling (about abortion as well as childbirth) to women who requested information about managing an unintended pregnancy. In 1988, however, DHHS issued regulations that prohibited employees of Title X clinics from providing counseling and referrals for abortion services. That regulation was challenged, but a May 1991 ruling by the U.S. Supreme Court upheld it (*Rust* v. *Sullivan*, 111 S. Ct. 1759 (1991)).

[c] Title XX projects are prohibited by the Title XX law from providing family planning services other than counseling and referral unless such services are not otherwise available in the community. Title XX projects are statutorily prohibited from providing abortions, abortion counseling, and abortion referrals.

[d] Under Title XX, care services for pregnant or parenting adolescents include pregnancy testing and maternity counseling, adoption counseling and referrals, primary and preventive health services including prenatal and postnatal care, nutrition information and counseling, referral for screening and treatment of STDs, referral to pediatric care, family life education, educational and vocational services, referrals to maternity services, mental health services and referrals, child care to enable the parent to go to school or work, consumer education and homemaking, and family planning services.

SOURCE: Office of Technology Assessment, 1991.

million adolescent females ages 15 to 19 (47a,196).[107] Title X clinics are rarely visited by young males unless they are accompanying a female partner (148).

Title X clinics offer a broad range of family planning methods (including contraceptives that have to be delivered by a clinic or a private physician) and services. In 1983, for example, 99 percent of family planning agencies offered pregnancy testing, 92 percent offered pregnancy counseling, 95 percent offered testing for STDs, 70 percent offered community education; 71 percent offered treatment for STDs; 60 percent offered infertility counseling; 50 percent had programs for parents; 47 percent had special staff for helping teenagers; 46 percent offered prenatal care; 44 percent had teen outreach; 39 percent had programs for adolescent mothers; 31 percent offered genetic counseling; and 20 percent had programs for young men (148,193a).

The services that are most commonly provided to adolescents at an initial visit to a family planning clinic include information concerning various methods of contraception (e.g., their use, effectiveness, and potential risks), counseling in the choice of an appropriate method; a medical evaluation involving a pelvic examination, breast examination, blood pressure check, blood test, and a Pap smear (148,193b). About two-thirds of first visits involve a pregnancy test and urinalysis to test for possible contraindications to the use of some contraceptive method. In addition, about two-thirds of all first visits include testing for STDs (193b).[108]

Family planning clinics are generally more willing than private physicians are to provide contraceptive services to unmarried adolescents under age 18 without parental consent or notification (148).[109] The provision of contraceptives to adolescents by Title X clinics has been controversial,[110] but the courts have thus far held that adolescents may obtain Title X family planning services without parental consent or notification (196).[111] Thus, although Title X grantees are statutorily required to encourage family involvement for adolescent patients, Title X clinics can provide contraceptive services to adolescents without parental consent or notification.[112]

Because the Title X program is supposed to serve low-income women in need of subsidized family planning services, the services provided by Title X clinics are generally offered at lower fees than are charged by private physicians (148,161). Clinics that receive Title X funds must provide family planning services free of charge to individuals whose incomes do not exceed 100 percent of the Federal poverty guidelines. For individuals whose income is between 100 percent to 250 percent of the poverty level, fees are determined on a sliding payment schedule. Adolescents seeking family planning services without parental consent are generally assumed to be medically indigent (47a).

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[107] The number of adolescents using family planning clinics increased dramatically between 1969 and 1983, from 214,000 to 1.6 million (148). The proportion of adolescent clinic patients also increased rapidly in the early years of the Title X program, but since 1979, the percentage has been stable at about 33 percent (148).

[108] Information on the prevalence of HIV infection and STDs among U.S. adolescents is presented in ch. 9, ''AIDS and Sexually Transmitted Diseases: Prevention and Services,'' in this volume.

[109] Physicians in States that do not have explicit consent laws for minors have been found significantly less likely to serve unmarried teenagers on their own authority (148,161). In States without explicit consent laws for minors, adolescents may have better access to contraceptive services through family planning clinics than through private physicians (148). As noted in ch. 17, ''Consent and Confidentiality in Adolescent Health Care Decisionmaking,'' in Vol. III, a little under half of the States and the District of Columbia have statutes that specifically authorize minors to give their own consent for what are variously described as contraceptives, birth control services, or services for the prevention of pregnancy. In the other States, there are no laws specifically authorizing minors to give consent or the laws are ambiguous.

[110] In 1983, DHHS attempted unsuccessfully to implement regulations *requiring* that family planning clinics receiving Title X funds notify parents when contraceptives were prescribed for their unemancipated adolescent children. The regulations were challenged, however, and ultimately, two Federal courts enjoined DHHS from implementing them. For further discussion, see ch. 17, ''Consent and Confidentiality in Adolescent Health Care Decisionmaking,'' in Vol. III.

[111] See ch. 17, ''Consent and Confidentiality in Adolescent Health Care Decisionmaking,'' in Vol. III for a review of Federal and State law pertaining to parental consent and notification in situations involving family planning services and other health services related to sexual activities (e.g., STD treatment, pregnancy-related health services).

[112] A study published in 1980 found that nearly two-thirds of adolescents seeking contraceptive services from organized family planning providers thought their parents knew they were doing so, but a significant minority said their parents were not aware they were using the services (148,193c). Among the adolescents whose parents did not know, a large proportion said they would not come to a family planning clinic if parental notification were required.

The use of Title X funds for abortion "as a method of family planning" has been prohibited by statute (sec. 1008) and by regulations since the enactment of the Title X program (55a,197). Prior to 1988, DHHS had interpreted this directive as having no bearing on speech and information between a pregnant woman and her physician or counselor at a clinic receiving Title XX funds. Thus, Title X clinics were able to provide abortion counseling and referrals for many years.

In 1988, however, DHHS issued new Title X regulations prohibiting clinics that receive Title X funds from providing abortion counseling or referrals to pregnant women (53 FR 2921). Section 59.8 of the 1988 regulations specifies that "once a client served by a Title X project is diagnosed as pregnant, she must be referred for appropriate prenatal and/or social services by furnishing a list of available providers that promote the welfare of the mother and unborn child." If a pregnant client asks for information about abortion or its availability, the Title X clinic counselor is to reply that "the project does not consider abortion an appropriate method of family planning." Section 59.9 of the 1988 regulations requires a Title X project to be "organized so that it is physically and financially separate" from "prohibited activities." Finally, Section 59.10 of the regulations prohibits Title X clinics from engaging in activities that "encourage, promote, or advocate abortion." The prohibition reaches all activities or information that "assist" a woman in obtaining abortion or that make the abortion option more "accessible."

A number of State governments and private organizations initiated court action to prevent implementation of these Title X regulations (9b,197), but the regulations were upheld on statutory and constitutional grounds by the U.S. Supreme Court in a May 1991 ruling [*Rust* v. *Sullivan*, 111 S. Ct. 1759 (1991)]. If in response some large-scale providers of family planning services no longer accept Title X funds, adolescents' access to contraception and abortion could be seriously limited. As this volume of this Report was being prepared for publication, the U.S. Congress was considering various amendments to Public Law 91-572. If passed and signed by the President, some of these amendments would codify that Congress did not mean to exclude abortion *counseling* as part of its 1970 prohibition on providing abortions in Title X clinics. Passage of such an amendment would help ensure that adolescents (as well as other individuals) could continue to get access to abortions as needed and as legally available to them.[113]

Research and Other Activities Supported by Title X Funds—In addition to providing grants for family planning clinics, Title X funds training for personnel to improve the delivery of family planning services; promotes service delivery improvement through research; and develops and disseminates information on family planning (197). Title X grants for research related to family planning, training of personnel for family planning clinics, and the development and dissemination of information on family planning are handled directly by the Office of Population Affairs. Topics of research include problems of human fertility and infertility, development of effective methods for fertility regulation, evaluation of contraceptive methods, and research in the changes in population structure (202).

Some observers have suggested that these efforts may not be adequate to meet current needs. In 1990, the National Academy of Sciences' Committee on Contraceptive Development criticized the United States for a recent lack of leadership in the development of contraceptive technologies (130). The National Academy of Sciences' committee also said that additional attention to the factors that would "promote contraceptive use among individuals not seeking to become pregnant is also important" (130).

The Title XX Adolescent Family Life Program

The Adolescent Family Life (AFL) program under Title XX of the Public Health Service Act was enacted as part of the Omnibus Budget Reconciliation Act of 1981 and is administered by the Office of Population Affairs within DHHS. As shown in table 10-10, the Title XX AFL program awards Federal grants for two types of demonstration projects: 1) projects that seek to prevent adolescent pregnancy (primarily by encouraging abstinence from sexual activity), and 2) projects that provide health and social services (including adoption) for pregnant or parenting adolescents. In addition, the Title XX AFL program supports research on the causes and consequences of adolescent pregnancy and parenting (196,202).

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[113] As noted above, and in ch. 17, "Consent and Confidentiality in Adolescent Health Care Decisionmaking," in Vol. III, legal restrictions on adolescents' independent access to abortion include certain State requirements for parental consent and notification. Federal constitutional law concerning the permissible scope of State regulation of abortion as interpreted by the U.S. Supreme Court appears to be in flux.

From the time of its inception, the Title XX AFL program has been funded with appropriations that have not exceeded $15 million per year (e.g., $14.9 million in fiscal year 1984, $14.7 million in 1985, $14.5 million in 1986, $14.0 million in 1987, $9.5 million in 1988, and $9.5 million in 1989) (202). The AFL program's formal authorization expired in 1985. Since then, the program has been reauthorized through the appropriations process via continuing resolutions. In fiscal year 1990, Congress appropriated $9.5 million for the AFL program.

About one-third of Title XX AFL funding goes to demonstration projects for *adolescent pregnancy prevention*. AFL adolescent pregnancy prevention projects seek to find the means, within the context of the family, to reach male and female adolescents before they become sexually active in order to promote abstinence from premarital sexual relations (196). These projects emphasize the importance of abstaining from sexual intercourse except in the context of marriage, parent-child communication, and the development of skills to resist peer pressure.

Most of the other two-thirds of Title XX AFL funding goes to demonstration projects that provide *care for adolescents who are pregnant or parenting*. AFL adolescent care projects provide, directly or by referral, health and social services that include pregnancy testing and maternity counseling; adoption counseling; primary and preventive health care; nutritional information; screening for venereal diseases; education and vocational services; and mental health services (196). Title XX projects are not permitted to offer adolescents contraceptive services unless they are not otherwise available in the community and cannot provide abortions, abortion counseling or abortion referrals. Adolescents must be under age 19 to participate in AFL demonstration projects, and they are generally required to have parental consent (196).

As of 1989, the AFL program was administering 88 demonstration projects around the country (196). In 1982, AFL pregnancy prevention projects served 102,000 adolescents under age 19 (48,000 males and over 54,000 females). In 1986, AFL care projects served approximately 15,000 pregnant and parenting adolescents (10,728 females, 3,387 males); these projects also served 6,274 family members and 5,689 infants of adolescent mothers.

These data say nothing about the impact of AFL projects on either the prevention of adolescent pregnancies or the amelioration of the negative effects of adolescent pregnancies. All the AFL projects are required to include an evaluation component. However, few AFL projects to date have included experimental or even adequate quasi-experimental designs which would enable firm conclusions to be drawn about the impact of these programs (220a).

In a 1991 review of evaluations of AFL-funded pregnancy prevention curriculum programs, White and White concluded that there is a need for comprehensive examination of such programs to be made available in academic publications (220a). The evaluations they were able to locate came from a variety of sources, including testimonials by project directors. White and White noted that many of the evaluations lacked important details about methodological procedures; many may not have been objective (220a). White and White noted that "the lack of available information inhibits researchers in their attempts to design further program evaluations, causes speculation about the efficacy of the programs, and prohibits informed policy recommendations" (220a). They suggested that Federal funding for evaluation research on the programs be increased (220a). Increasing the funding for evaluation research would be no small feat within the existing Title XX budget of less than $10 million. But if rigorous evaluations are not increased and improved methodologically, important questions about the effectiveness of federally funded pregnancy prevention programs will not be able to be answered.

Other Federal Programs Pertaining to Adolescent Pregnancy and Parenting

Although it has been noted that there are no Federal programs specifically designed to ameliorate the long-term consequences of adolescent pregnancy and childbearing (196), there are several policies and programs that may be helpful to pregnant and parenting adolescents. The fact that these and other Federal programs were not well coordinated provided some of the impetus for the recently announced reorganization of several DHHS programs for children and families (202b). As discussed below, it is not yet clear how effective this Federal reorganization will be in terms of service delivery at the local level or in terms of the needs of adolescents specifically. Further, the reorganization affects only selected programs in DHHS and does not specifically include housing, education, or labor programs; nor does it include Medicaid.

Various Federal programs apart from Title X and Title XX of the Public Health Service Act offer services that are relevant to the problems confronted by adolescents who are at risk of pregnancy or who are already pregnant or parenting (196).[114]

- *Medicaid*—Medicaid (Title XIX of the Social Security Act) is a federally aided, State-administered program that was established in 1965 to provide medical assistance for very low-income people meeting specific income and family structure requirements.[115] Some—though not all—poor adolescents are covered by Medicaid. At the Federal level, Medicaid is administered by the Health Care Financing Administration in DHHS.

  In order to receive Federal Medicaid funds, States are required to offer a specific minimum benefit package that includes, among other things, hospital inpatient and outpatient services, physician services, nurse midwife services, and family planning services. Thus, Medicaid is a source of Federal financing of *family planning services* and supplies for low-income adolescents, who meet the program's eligibility requirements.[116] Many adolescents living in poverty are not eligible for Medicaid, so not all poor adolescents can get family planning services through Medicaid. As noted elsewhere in this Report, in fiscal year 1988, Medicaid spent an estimated $16 million on family planning services for the 4.583 million adolescents ages 10 through 18 who were enrolled in the program ($3 million or $1 per capita for the 2.657 million adolescents ages 10 to 14 and $10 million or $7 per capita for the 1.928 million adolescents ages 15 to 18.[117] Medicaid reimbursement for contraceptive services provided to adolescents is accepted by the vast majority of family planning clinics (90 percent in 1983), but a significant percentage (53 percent in 1983) of the private physicians who could give adolescent patients contraceptives will not accept Medicaid reimbursement (148).[118]

  In addition to being a source of funding for contraceptive services, Medicaid is a source of Federal financing for *pregnancy-related care* for low-income women and pediatric care for children. The Omnibus Budget Reconciliation Act of 1989 (Public Law 101-239) required States to extend Medicaid eligibility to all pregnant women and children up to age 6 with family incomes up to 133 percent of the Federal poverty level.[119] An important policy issue which the recent extension of Medicaid eligibility did not address, however, is the effect of declining Medicaid participation rates among specialists in obstetrics/gynecology and pediatrics on Medicaid enrollees' access to care.[120]

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[114] It also should be noted that Title IX of the Education Amendments (1972) prohibits discrimination in education because of pregnancy, childbearing, or marital status (148). Consequently, all school systems receiving Federal funds must allow pregnant adolescents to remain in school throughout pregnancy and to return after the birth of their child (148).

[115] Eligibility for Medicaid has generally been linked to participation in the AFDC cash welfare program. AFDC eligibility hinges not only on whether family income and resources fall within the State's AFDC limits but also, with few exceptions, on whether the family has a "deprivation factor" (i.e., at least one parent is dead, disabled, continually absent from the home, or as of October 1990, in two-parent families where the principal bread winner is unemployed). For a discussion of Medicaid eligibility requirements, coverage, payment policies, etc., as they pertain to adolescents, see ch. 16, "Financial Access to Health Services," in Vol. III.

[116] In fiscal year 1985, Federal funds constituted 84 percent of public expenditures on contraceptive services and supplies. Family planning services grants under *Title X* of the Public Health Service Act accounted for 34 percent; *Medicaid reimbursements* accounted for 34 percent; *social services block grant* funds accounted for 10 percent; and *maternal and child health block grant* funds accounted for 6 percent (74c).

[117] See table 16-8 in ch. 16, "Financial Access to Health Services," in Vol. III For a breakdown of Medicaid expenditures on adolescents ages 10 through 18 by type of service.

[118] In fiscal year 1983, $108 million of Medicaid funds were used to reimburse organizations and private physicians for contraceptive services for all ages (148).

[119] Poor adolescents' access to Medicaid was changed by the Omnibus Budget Reconciliation Act of 1990 (Public Law 101-508), which required that beginning July 1, 1991, children born after Sept. 30, 1983, with family incomes up to 100 percent of the Federal poverty level, are to be phased in to the Medicaid program. This change will not, therefore, affect the current generation of adolescents.

[120] Medicaid participation rates and the effect of Medicaid payment policies on access to care and the availability of qualified providers are discussed further in ch. 16, "Financial Access to Health Services," in Vol. III.

The use of Federal Medicaid funds to subsidize poor women's *abortions* has been statutorily prohibited since the implementation of the Hyde Amendment in 1977 (74c). Hyde Amendments have been attached to the annual appropriations bills for DHHS and the U.S. Department of Labor every year since 1977. Federal Medicaid funds can be used for abortions only in the tiny number of cases in which a woman's life is threatened if a pregnancy is carried to term.[121]

- *Maternal and Child Health Block Grant Program, under Title V of the Social Security Act*—As discussed elsewhere in this Report, the Title V Maternal and Child Health Services Block Grant Program, is administered at the Federal level by the Bureau of Maternal and Child Health of the Health Resources and Services Administration within the Public Health Service of DHHS.[122] Federal maternal and child health block grants are awarded to the States, which in turn provide grants directly to public and private providers of maternal and child health care services. The goal is to "assure access to quality maternal and child health services, especially for those with low incomes and living in areas with limited availability of health services." Title V is also used to provide funds for special projects of regional and national significance (SPRANS) that contribute to maternal, infant, and child health. In fiscal year 1988, the appropriation for the Title V program was $52.6 million. Eighty-five percent ($444.3 million) was allocated to State health agencies to help them promote, improve, and deliver maternal and child health services, and 15 percent ($82.3 million) was set aside for SPRANS. Title V funds may, but do not have to be, used for family planning services.

  States have wide latitude in establishing the types of maternal and child health services—e.g., family planning services, prenatal, delivery, and postpartum care for low-income mothers, well-child care—that are provided and the distribution of funds to support those services (74c). Expenditures for specific services under the maternal and child health block grant program are nearly impossible to identify, largely because the Federal Government does not require the collection or reporting of pertinent data (199). The problem is exacerbated by the fact that there are no requirements regarding minimum services or eligibility (199). As a consequence, very little is known about who receives what types of services under the maternal and child health block grant. It is virtually impossible to determine the amount of Title V funding for services to adolescents or their children or the adequacy of services they receive.

- *Community and migrant health centers*—The community health center program is one of the largest categorical grant programs, providing maternal and child health care, as well as other services, to residents of medically underserved areas (199). In fiscal year 1985, community health centers received $383 million in Federal funding (199). Nearly half of community health center users are without health insurance (199). As discussed elsewhere in this Report, funds are provided to community and migrant health centers by the Health Resources and Services Administration's Bureau of Health Care Delivery and Assistance. In 1989, 814,000 adolescents received care in community and migrant health centers, including 117,000 females ages 10 to 14 who received family planning services.[123] In 1988, community and migrant health centers rated teen pregnancy, infant mortality, and comprehensive perinatal care programs as their top priorities (135b). In fiscal year 1988, the Bureau of Health Care Delivery and Assistance awarded $20 million in grants to fund comprehensive perinatal care programs to provide primary health care services to low-income pregnant women and infants at 206 community and migrant health centers. These comprehensive perinatal care programs provided case-managed, coordinated perinatal services to 6 percent of all U.S. pregnant adolescents under the age of 20 and 29 percent of pregnant adolescents 15 years of age and under (207d).

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[121] A number of States use their own monies to provide publicly funded abortions for poor women (74c).

[122] More information on the Title V maternal and child health block grant program is provided in ch. 18, "Issues in the Delivery of Services to Selected Groups of Adolescents," and in ch. 19, "The Role of Federal Agencies in Adolescent Health," in Vol. III. Under the proposed reorganization of certain programs in DHHS, administration of the maternal and child health block grant would be moved to the new Administration on Children and Families (202b,222a).

[123] Comparable data on adolescents ages 15 and over who received family planning services are not available. As noted in ch. 19, "The Role of Federal Agencies in Adolescent Health," in Vol III, the collection of data on the use of community and migrant health centers by adolescents ages 15 and above was discontinued about 8 years age.

- *Social Services Block Grant Program, under Title XX of the Social Security Act*—As discussed elsewhere in this Report, the Title XX Social Services Block Grant Program, which is administered by the Office of Human Development Services in DHHS, provides block grants to States for social services.[124] States are given wide discretion in determining what services will be provided, who will be eligible for services, and how the funds will be distributed in the State. Some States use social services block grants for family planning services and for foster care and adoption services and health-related services, but there is little information on how many adolescents or children born to adolescents are affected.
- *Aid to Families With Dependent Children (AFDC) program*—As discussed elsewhere in this Report, the AFDC program is a cash assistance program for needy families with children that is administered by the States within broad Federal guidelines.[125] At the Federal level, it is administered by the Family Support Administration of DHHS. Families started by women under age 20 account for the majority of families on welfare, but adolescent parents constitute a small portion of the AFDC population at any given point. In fiscal year 1987, 121,000 adolescents (85 percent of whom were females) received AFDC benefits as heads of household (201b). Congress enacted major welfare reform in the Family Support Act of 1988 (Public Law 100-485). To give families receiving AFDC an opportunity to become self-sufficient, the Family Support Act required all States to implement a comprehensive education, job training, and work experience program known as the Job Opportunity and Basic Skills (JOBS) program by October 1, 1990 (150b). With few exceptions, all AFDC mothers ages 16 through 19 years of age must participate in the JOBS program or face the prospect of a cut in their AFDC benefit.[126] States must provide adolescent JOB participants with child care, transportation, and any other support services (e.g., parent education, counseling, peer support groups) that they deem necessary for an adolescent parent to participate in the JOBS program. If States lack the resources to provide the necessary support services or if there is no JOBS program in the area, AFDC mothers ages 16 to 19 cannot be required to participate in JOBS.[127]

If well implemented, the JOBS program could have a substantial positive impact on adolescent parents. According to the National Health Policy Forum, the Family Support Act's effect on adolescent parents and their children to date is not yet known, in part because DHHS reporting rules initially did not require the collection of very detailed program information (150b).[128] In April 1991, the Center for Law and Social Policy conducted a survey of the States to fill the information gap and learn about adolescent parent participation in JOBS. That survey found that there were about 25,000 adolescent parents participating in JOBS in the 24 States that reported adolescent parent data (150b). About two-thirds of these 25,000 adolescents were in five States (Ohio, Florida, Illinois, Connecticut, and Oklahoma). The 24 States varied widely in the extent to which they were serving all of their AFDC adolescent parents (e.g., Oregon was estimated to be serving 69 percent of its adolescent mothers, Ohio serving 60 percent, and 10 other States were serving between 30 and 54 percent, while Massachusetts was serving about 13 percent and California was serving about 2 percent)

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[124] More information on the Title XX Social Services Block Grant Program is provided in ch. 18, "Issues in the Delivery of Services to Selected Groups of Adolescents," and in ch. 19, "The Role of Federal Agencies in Adolescent Health," in Vol. III.

[125] For further discussion of the AFDC program, see ch. 18, "Issues in the Delivery of Services to Selected Groups of Adolescents," and ch. 19, "The Role of Federal Agencies in Adolescent Health," in Vol. III.

[126] Adolescents ages 16 and over are exempt if they are either ill or incapacitated, are needed at home because their child is ill or incapacitated, are in school full time, or are in their second or third trimester of pregnancy (150b).

[127] According to the National Health Policy Forum, this is a sizable loophole in the Family Support Act's requirements for adolescent participation in the JOBS program (150b).

[128] New DHHS reporting rules will become effective in October 1991 and will require detailed program information but will not require information on the types of supportive services that States are providing (150b).

(150b). The Center for Law and Social Policy's survey also found that educational placements of JOBS adolescent mothers were generally far more common than job training or work placements, although some States (e.g., Iowa, Missouri, Ohio, and Oklahoma) had substantial numbers in job training. Only eight States could report how many JOBS parents were receiving child care subsidized under JOBS, and these data showed substantial variation among the States (150b).

- *Child Support Enforcement Program*—As discussed elsewhere in this Report, the Child Support Enforcement Program was established in 1975 under Title IV-D of the Social Security Act. This program is aimed at helping States locate absent fathers, establish their paternity, and enforce their child support obligations. At the Federal level, the Family Support Administration provides assistance to States to help them operate programs that offer services to individuals and families to help them collect child support from absent parents.[129] The number of single adolescent mothers rearing children affected by this program and the nature of the program's effects on adolescent parents or their children are unknown.
- *Food and nutritional assistance programs such as the Special Supplemental Food Program for Women, Infants, and Children (WIC) and the Food Stamp Program*—As discussed elsewhere in this Report, the U.S. Department of Agriculture's Food and Nutrition Service administers several programs that provide food assistance to low-income individuals and families, including the Food Stamp Program, WIC, and various child nutrition programs.[130] Under the WIC program, participants receive vouchers for food such as milk, cheese, fruit juices, eggs, dry beans, iron-fortified cereal, and infant formula (88). Pregnant, breastfeeding, or postpartum adolescents make up an estimated 2.8 percent of WIC participants (200a). An evaluation of the prenatal part of WIC in Massachusetts found that the program improved pregnancy outcomes among all participants, but especially among teens and unmarried women (88,117a). To OTA's knowledge, there is no comparable information on the percentage of Food Stamp Program participants who are breastfeeding, or postpartum adolescents or their children. There is also no information on the extent to which existing food and nutritional assistance programs meet the needs of adolescents who are pregnant or parenting and their children.
- *Employment programs for economically disadvantaged youth*—As discussed elsewhere in this Report, the U.S. Department of Labor, through its Employment and Training Administration, supports training and employment programs for economically disadvantaged youth under the 1982 Job Training Partnership Act. Titles II-A and II-B authorize block grants to the States. In 1989, $715.1 million in Title II-A funds was earmarked to support training services for economically disadvantaged adolescents, and $709.4 million in Title II-B funds was designated for support of the Summer Youth Employment and Training Program for adolescents.[131] Title IV authorizes federally administered programs such as the Job Corps, a joint venture between the U.S. Department of Labor, private corporations, and nonprofit organizations that provides employment and training in primarily residential centers for disadvantaged adolescents and young adults ages 16 to 21.[132] In program year 1989, there were 100,000 participants in the Job Corps.
- *Other programs*—A variety of Federal programs discussed elsewhere in this Report may assist pregnant or parenting adolescents by, for example, providing child care assistance (e.g., the Head Start Program, Child Care Food Program, comprehensive child development centers); housing assistance (e.g., low-income public housing, leased housing assistance); funding for projects for substance-abusing

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[129] The Child Support Enforcement Program is discussed in ch. 18, "Issues in the Delivery of Services to Selected Groups of Adolescents," and ch. 19, "The Role of Federal Agencies in Adolescent Health," in Vol. III.

[130] These programs are discussed in ch. 19, "The Role of Federal Agencies in Adolescent Health," in Vol. III.

[131] The Federal Summer Youth Employment and Training Program provides more than 650,000 low-income teenagers throughout the country with 7 to 8 weeks of employment during the summer. Funding from this program was used to support the Summer Training and Education (STEP) Program discussed earlier in this chapter.

[132] For additional information about these and other programs administered by the U.S. Department of Labor, see ch. 19, "The Role of Federal Agencies in Adolescent Health," in Vol. III.

pregnant and postpartum women (e.g., alcohol, drug abuse, and mental health block grants to States); funding for community and migrant health centers that provide primary health care and other services to medically underserved populations; and other services.

As noted elsewhere in this Report, there are few data on the utilization of many of these Federal programs by adolescents, on expenditures for adolescents, or on the adequacy of available services in terms of meeting adolescents' needs. Furthermore, a U.S. General Accounting Office report issued in July 1986 said little is known about the effectiveness of services provided for adolescents under these programs (195b,196). Numerous other health, education, labor, employment and social service agencies may have contact with adolescents at risk of pregnancy, or already parenting, or have the potential to serve them. Although the array of programs may present a vast set of potential means of assistance for sexually active, pregnant, or parenting adolescents, there are substantial barriers to the effective use of such programs and services by adolescents (see, e.g., 150a).[133] In addition, some services needed by adolescents may not be available either generally or in a specific adolescent's community (169).

The lack of coordination among programs relevant or potentially relevant to adolescents at the Federal level is discussed in Volume III of this report. Strategies to improve coordination at the Federal and local levels have been described by the National Commission To Prevent Infant Mortality (150a). Furthermore, in April 1991, DHHS announced a reorganization of some programs in a new Administration for Children and Families (202b). The reorganization would combine all programs of the Family Support Administration and the Office of Human Development Services, and the Title V maternal and child health block grant program administered by the Health Resources and Services Administration (202b). One purpose of the new administration would be to bring together Federal initiatives affecting pregnant and parenting adolescents. Because specific features of the reorganization were still being debated as this volume was being prepared, OTA could not evaluate the potential effectiveness of this reorganization in delivering coordinated, comprehensive services to pregnant and parenting adolescents. Congress may want to investigate the effects of the reorganization specifically on programs for pregnant and parenting adolescents in the future.

Conclusions and Policy Implications

The United States has higher adolescent pregnancy rates, birth rates, and abortion rates than a number of other industrialized countries. Of the roughly one million U.S. adolescents who become pregnant each year, about half a million give birth. In 1988, there were 488,941 births to U.S. females under age 20 (478,353 to females ages 15 to 19 and 10,588 to females under age 15). The overall birth rate among U.S. adolescents has leveled off since the mid-1970s, but birth rates among black adolescents have been increasing rather steadily since 1984. Furthermore, the birth rate among unmarried U.S. adolescents has been skyrocketing. Whereas one-fifth of births to U.S. females under age 20 in 1970 were births to single mothers, about two-thirds of births to U.S. females under age 20 in 1988 were births to single mothers (312,499 births to single females ages 15 to 19 and 9,907 births to single females under age 15).

These trends related to adolescent pregnancy and childbearing are disturbing in light of meager Federal involvement in workable pregnancy prevention efforts and efforts to assist pregnant and parenting adolescents. For a decade, U.S. executive branch policy has emphasized the teaching of abstinence over any other approach to the prevention of pregnancy. While seeking to delay sexual involvement may be appropriate and effective for some adolescents who are not yet sexually active, there is no evidence that the promotion of abstinence alone is an appropriate or effective approach to pregnancy prevention for the large group of adolescents who are already sexually active. On average, 65 percent of U.S. males ages 15 to 19 and 53 percent of U.S. females ages 15 to 19 report that they have had sexual intercourse.

Policy and program changes are needed to prevent adolescent pregnancy and to improve the lives of adolescent parents and their children. In making these changes, efforts should be made to involve adolescent males as well as females. OTA's review of the literature on adolescent pregnancy prevention suggests conclusions similar to those of the National Academy of Sciences' Panel on Adolescent Pregnancy and Childbearing and other analyses (47a,107a). There is no "magic bullet" for the prevention of adolescent pregnancy. Rather, young adolescents who are not already sexually active should be encouraged to delay sexual activity, and sexually active adolescents should be provided with both the capacity (e.g., contraceptives, information) and motivation (e.g., life skills training, the hope of obtaining jobs) to avoid too-early pregnancy and childbearing. Promising models for the provision of contraceptives (e.g., SLHCs) and enhancing motivation exist; both additional support and more rigorous evaluation of these models are needed. Also needed is support for research on contraceptive technology development, as well as investigation into the reasons for the high contraceptive failure rates among adolescents.

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[133] Also see Vol. III of this Report, *Adolescent Health: Crosscutting Issues in the Delivery of Health and Related Services.*

Although preventing too-early childbearing among U.S. adolescents is clearly preferable, careful evaluations of efforts such as Project Redirection suggest that investing in improving the lives of adolescent mothers and their children has clear benefits. Such programs ought to be extended to additional numbers of adolescent parents.

Abortion is a legal alternative to parenthood for pregnant adolescents, but not an option that a pregnant adolescent makes lightly. For adolescents who may choose abortion, there are geographic and financial limitations on access to abortions, as well as legal ones. Many births to adolescents are unwanted.[134] If the Federal Government is not going to act more decisively to prevent pregnancies among U.S. adolescents or to make life for adolescent parents and their children less onerous, it could act to make abortion more available.

Finally, males—both adolescent and older males—seem to have been largely forgotten in discussions of adolescent pregnancy and parenting. New efforts to increase child support enforcement among unwed and otherwise absent fathers may eventually be effective in inculcating a sense of responsibility and obligation in sexually active males, but greater access to contraception and increased motivation to avoid unprotected sexual intercourse are probably also necessary.

Photo credit: March of Dimes Birth Defects Foundation

Specific options for congressional consideration pertaining to adolescent pregnancy and parenting are listed in Volume I.

Chapter 10 References

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[134] Even at the time of birth, one out of four adolescents overall and one out of three black adolescents say that their baby was unwanted at conception (207c).

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PREVENTION AND SERVICES RELATED TO MENTAL HEALTH PROBLEMS

Chapter 11

MENTAL HEALTH PROBLEMS: PREVENTION AND SERVICES

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Chapter 11

MENTAL HEALTH PROBLEMS: PREVENTION AND SERVICES

Introduction

A popular view of adolescent mental health is that adolescence is inevitably a time of "storm and stress" (158a). Inner turmoil and doubt, as well as conflict with family members and the larger society, are commonly assumed to be normal signs of psychological development in adolescence.

While adolescence is clearly a time of significant physiological, cognitive, and social changes, serious emotional disturbance is not inevitably the result of attempting to cope with the changes of adolescence (148). Research over the past two decades has demonstrated little support for the idea that emotional problems are a hallmark of adolescence. Nonetheless, the available data do indicate that a substantial proportion of the adolescent population suffers from psychological problems serious enough to warrant mental health treatment.

This chapter provides an overview of adolescent mental health problems and illustrates issues related to prevention with analyses in two areas: 1) efforts related to the promotion of mental health and 2) efforts related to the prevention of suicide. It also examines the mental health treatment system. The chapter ends with a review of major Federal programs and policies pertaining to adolescent mental health and conclusions and policy implications.

Background on Adolescent Mental Health

A widely accepted system for classifying mental disorders of children, adolescents, and adults is the *Diagnostic and Statistical Manual of Mental Disorders*, 3rd ed. (revised) of the American Psychiatric Association—also referred to as DSM-III-R (6). Although there is criticism of its lack of a developmental perspective (74,45) and controversy over the applicability of adult diagnoses for disorders of childhood and adolescence (1), this widely used classification system provides clinicians and researchers with a common language for identifying mental disorders. Use of the DSM-III-R classification system in epidemiologic and clinical research also enhances the comparability of results from different investigations.

Examples of DSM-III-R mental disorders that affect adolescents are shown in box 11-A. Some of these disorders are usually first diagnosed in childhood, and others are most commonly seen in adults.[1]

Recent studies that have looked specifically at the prevalence of mental health problems among adolescents are discussed below. Also discussed at length are suicide and suicide attempts, which, though not DSM-III-R mental disorders, are behavior indicators of mental health problems. Finally, this section considers briefly the consequences of severe mental health problems for adolescents, for their families, and for society.

Prevalence of Mental Health Problems Among Adolescents

Prevalence of Diagnosable Mental Disorders Among Adolescents

In its 1986 report on children's mental health, OTA concluded that at least 12 percent of the population under the age of 18 (approximately 7.5 million of the 63 million children and adolescents in the United States) suffered from some type of diagnosable mental disorder (202). This finding was supported by a 1989 Institute of Medicine review suggested that the 12 percent figure was probably a conservative estimate of the prevalence mental disorders among children and adolescents (139). The overall prevalence of diagnosable mental disorders among individuals under age 20 may actually be higher than 12 percent—i.e., closer to 20 percent, or one child in five (51) (see table 11-1). In an examination of five recent epidemiologic investigations (9,23,52,149,221), Costello found overall prevalence rates of diagnosable mental disorders ranging from 17.6 percent to approximately 25 percent in samples including adolescents (51). Kashani found a prevalence rate of 18.7 percent in a small study of

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[1] Even though problems related to psychoactive substance use are also included in the DSM-III-R classification of mental disorders, the volume of literature on adolescent substance abuse treatment and prevention is sufficiently large to warrant separate discussion. Thus, substance abuse problems and their treatment in adolescence are included in ch. 12, "Alcohol, Tobacco, and Drug Abuse: Prevention and Services," in this volume.

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Box 11-A—Examples of DSM-III-R Mental Disorders That Affect Adolescents[1]

Disruptive Behavior Disorders—The three primary behavior disorders of concern during adolescence are attention deficit hyperactivity disorder, oppositional defiant disorder, and conduct disorder.

Attention deficit hyperactivity disorder is a diagnosis made when adolescents have difficulty organizing their schoolwork or cooperating in group activities because of hyperactivity and inattentiveness. The onset of attention deficit disorder is typically before the age of 4, and the disorder often persists into adolescence.

Oppositional defiant disorder is a diagnosis made on the basis of a pattern of hostile and defiant behavior. Adolescents with oppositional defiant disorder are often argumentative, resentful, and easily annoyed by others, but not physically aggressive or prone to violate social norms.

Conduct disorder is a more serious diagnosis, although it also is made on the basis of a pattern of hostile and defiant behavior. Conduct disorder involves a pattern of behavior (lasting at least 6 months) in which the young person violates others' rights as well as age-appropriate social norms and displays at least 3 of 13 specified behavioral symptoms (e.g., truancy, lying, stealing, fighting).

Eating Disorders—Eating disorders in adolescence primarily include *anorexia nervosa* and *bulimia*. Anorexia nervosa is the severe and prolonged refusal to eat, with severe weight loss and an intense fear of becoming obese. Bulimia involves episodic and excessive eating binges unrelated to feelings of hunger. It is usually followed by self-induced vomiting or the use of laxatives. Death is less likely for bulimics than for anorexics, but physical health problems are common for both groups.

Mood (Affective) Disorders—Diagnoses of *depressive disorder* are made when individuals suffer from prolonged and severely disabling depression, as distinguished from the temporary and normal moods of unhappiness. Feelings of worthlessness, hopelessness, or irritability and thoughts of death or suicide are common. There is some evidence that antisocial behavior, aggressiveness, or substance abuse may hide or mask clinical depression but this notion remains controversial.

Bipolar or *manic-depressive disorder* involves extreme swings in mood between severe depression and intense elation. During the manic phase, hyperactivity and a decreased need for sleep are common, as are an inflated sense of self-esteem and a lack of recognition that the behavior is not normal. These manic periods alternate with periods of depression, sometimes immediately following each other and sometimes with a period of normal moods between the manic and depressive phases.

Anxiety Disorders—Anxiety disorders are disorders in which excessive anxiety is the primary symptom. *Separation anxiety disorder* involves irrational fears or panic about being separated from those to whom one is attached, usually the parent(s). Physical complaints may accompany the disorder. While separation anxiety disorder is more common among children, it may continue into adolescence.

Individuals suffering from *avoidant disorder* become anxious in the presence of unfamiliar people and socially withdraw, causing severe impairment in their social functioning. *Overanxious disorder* involves generalized anxiety about future events or one's performance in a variety of situations such as exams or social activities.

Adjustment Disorder—Adjustment disorder develops in reaction to a stressful event or series of events (e.g., parental divorce, illness or death, moving). The disorder impairs ability to function in school or on the job, because the individual cannot cope with problems in an appropriate way and may become emotionally incapacitated by stress.

Schizophrenia—Schizophrenia is a severe and disabling mental illness that involves disturbances in emotional expression, behavior, or thought patterns. Although the illness occurs most commonly in adults, it frequently has its onset in the later teen years. Also, many people who become schizophrenic as adults show precursory symptoms of the disorder during their adolescent years. Among the essential features of schizophrenia are the presence of psychotic symptoms, which may include delusions, hallucinations, or catatonia.

Suicide and Suicidal Ideation—Suicide and suicidal ideation are not diagnostic categories included in DSM-III-R but are behavioral symptoms of underlying problems, many, but not all, of which may relate to the mental health status of an individual. Suicide is the taking of one's own life. Suicidal ideation involves preoccupation with thoughts about committing suicide and may be a precursor to the act itself.

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[1] Substance abuse problems, including alcohol and drug dependency, are other DSM-III-R disorders that affect adolescents, but they are not included in this box. For further information, see ch. 12, "Alcohol, Tobacco, and Drug Abuse: Prevention and Services," in this volume.

SOURCE: Adapted from American Psychiatric Association, *Diagnostic and Statistical Manual of Mental Disorders*, 3rd ed., revised (Washington, DC: 1987).

Table 11-1—Prevalence Rates of DSM-III Diagnoses in Nonclinic Samples: Studies Using Methods Suitable for Nonclinician Interviews

Study[a]	Anderson et al., 1987	Bird et al., 1989	Velez et al., 1989	Costello et al., 1988	Offord et al., 1987	Kashani et al., 1987	National Health Interview Survey, 1988 (Zill and Schoenborn, 1990)
Country	New Zealand	Puerto Rico	U.S.	U.S.	U.S.	U.S.	U.S.
Informants	Child (Interview) Parent (Checklist) Teacher (Checklist)	Child (Interview) Parent (Interview)	Child (Interview) Parent (Interview)	Child (Interview) Parent (Interview)	Parent (Interview) Teacher (Checklist)	Parent (Checklist) Child (Checklist) Child (Interview)	Parent (Interview)
Sample	N = 782 Age 11	N = 777 Ages 4-16	N = 776 Ages 11-20	N = 789 Ages 7-11	N = 2,679 Ages 4-16	N = 150 Ages 14-16	N = NA[b] Ages 6-11 and ages 12-17
Specific diagnosis							
Attention deficit disorder (± Hyperactivity)	6.7%	10.1%	4.3%	2.2%	6.2%	2.7%	—
Oppositional disorder	5.7	9.7	6.6	6.6	NA	6.0	—
Conduct disorders	3.4	1.5	5.4	2.6	5.5	8.7	—
Separation anxiety	3.5	4.8	5.4	4.1	NA	8.7 (All anxiety disorders)	—
Overanxious disorder	2.9	NA	2.7	1.6	9.9 ("Emotional disorder")	NA	—
Simple phobia	2.4	2.3	NA	9.2	NA	NA	—
Depression, dysthymia	1.8	5.9	1.7 (Major depression)	2.0	NA	8.0	—
Enuresis (bedwetting)	NA	4.8	NA	4.4	NA	0.7	—
Total with one or more diagnoses	17.6%	18.0% ± 3.4%	20.6%	22.0% ± 3.4%	18.1%	18.7%	6-11: 12.7%[c] 12-17: 18.5%[c]

NA = Not available.

[a] Full reference citations are listed at the end of this chapter.

[b] In total, parents of 17,110 children ages 3 to 17 were interviewed in the 1988 National Health Interview Survey. The proportion of children or adolescents ages 6 to 11 and 12 to 17 is not readily available; however, the estimates shown were deemed reliable by NCHS.

[c] The number shown is the percentage of children of that age who "ever has an emotional or behavioral problem that lasted 3 months or more or required psychological help" (235).

SOURCE: Office of Technology Assessment, 1991.

150 14- to 16-year-olds (106), and the 1988 National Health Interview Survey (NHIS) conducted by the National Center for Health Statistics in the U.S. Department of Health and Human Services (DHHS) found a lifetime prevalence rate for 6- to 11-year-olds of 12.7 percent, and a lifetime prevalence rate for 12- to 17-year-olds of 18.5 percent (235). Thus, international, national, and local studies find similar overall rates of mental health problems among adolescents.[2]

In two studies reviewed by Costello that focused on adolescents (9, 221), the most common disorders were the disruptive behavior disorders of attention deficit disorder, oppositional defiant disorder, conduct disorder,[3] and the anxiety disorder known as separation anxiety disorder (51). A third study among adolescents found a higher rate of depression than the other investigations (106). The most notable variations from study to study were those relating to the rates of specific diagnoses—accounted for, in part, by different measures and differences in the samples. In addition, the studies reviewed by Costello, and the NHIS study, found differences in demographic risk factors for overall prevalence of emotional and behavioral problems. Older children were generally more likely than younger children to have a mental health problem; males were generally more likely than females to have a mental health problem; and those of low socioeconomic status were consistently more likely than those of high socioeconomic status to have a mental health problem.[4] Costello did not report on racial or ethnic differences, but NHIS found that white, non-Hispanic parents were more likely to report the existence of an emotional or behavioral problem than were black or Hispanic parents (235).[5] Further, NHIS reported a higher lifetime prevalence of emotional and behavioral problems among those 12-to 17-year-olds: 1) in urban areas[6] (19.1 percent) than in rural areas[7] (16.5 percent); and 2) living with families headed by a biological mother and a stepfather (29.1 percent), biological mother alone (2.5 percent), and "all other" family structures (25.8 percent), than by a biological mother and father (11.6 percent) (235).

Prevalence of Subjective Distress Among Adolescents

As discussed in chapters 2, 3, and 4 of this Report, there are several aspects of adolescence that may cause emotional distress among adolescents. Adolescents are rarely asked about such subjective distress, and the relationship of subjective distress to diagnosable mental disorders is not known.[8] Subjective distress is an important issue because access to formal sources of mental health treatment may depend on the existence of a diagnosable mental disorder (202). Two studies that did ask adolescents about their levels of distress are the National Adolescent Student Health Survey (8) and the Adolescent Health Survey conducted by the University of Minnesota (see 204).

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[2] It should be noted that the National Health Interview Survey (NHIS) differed from the other, more local, surveys in some respects. It involved only parents as respondents, it was in large part an estimate of lifetime prevalence, and the results pertain to a global rating, rather than to specific problems or disorders. Specifically, estimates of the prevalence of mental health problems were based on the responses of parents of children 3 to 17 to the following 1988 NHIS Child Health supplement questions: First, all parents were asked, "Has [your child] ever had an emotional or behavioral problem that lasted 3 months or more?" Parents who had not reported that their child had had such a problem were asked, "Has [your child] ever seen a psychiatrist, psychologist, doctor, or counselor about any emotional, mental, or behavioral problem?" Those who responded negatively to this question were asked, "During the past 12 months, have you felt or has anyone suggested, that [your child] needed help for any emotional, mental, or behavioral problem?" If the parent answered affirmatively to either of the latter questions, the child was counted as having had an emotional or behavioral condition, even if the parent had answered the initial question about such conditions in the negative (235).

[3] Some behaviors that might lead to a diagnosis of conduct disorder may also result in an adolescent's being considered delinquent. For further discussion, see ch. 13, "Delinquency: Prevention and Services," in this volume.

[4] Costello did not report quantitative results from the five studies she reviewed. In the NHIS study, the following percentages by family income were reported for 12- to 17-year-olds: 22.5 percent in families with incomes of less than $10,000; 19.3 percent in families with incomes between $10,000 and $24,999; 19.6 percent in families with incomes between $25,000 and $39,999; and 17.6 percent in families with incomes of $40,000 or more (235). Thus, while there were differences, they were not very substantial. If mother's education were to be used as an indicator of socioeconomic status, the picture is more complicated; 18.5 percent of 12- to 17-year-olds whose mothers had less than 12 years of education were reported to have had an emotional or behavioral problem some time in their lives, compared to 16.7 percent whose mothers had 12 years of education, and 20.1 percent whose mothers had more than 12 years of education (235).

[5] For 12- to 17-year-olds, the following percentages of parents reported the existence of problems lasting 3 months or more, or requiring psychological help, sometime during the child's life: 19.5 percent of white parents v. 15.1 percent of black parents; 18.9 percent of non-Hispanic parents v. 14.8 of Hispanic parents.

[6] Urban areas were defined as Metropolitan Statistical Areas (235).

[7] Rural areas were defined as areas other than Metropolitan Statistical Areas (235).

[8] As is implicit in box 11-A and table 11-1, DSM-III-R diagnoses for adolescents are somewhat weighted toward mental health problems that result in impairment obvious to an observer (e.g., oppositional defiant disorder, conduct disorder, attention deficit disorder, separation anxiety disorder). As noted above, investigators tend to find that these disorders are the most common among adolescents. Thus, the mental health problems of adolescents have often been referred to in summary fashion as "behavior disorders" a characterization that has been criticized recently (155b).

The National Adolescent Student Health Survey of 8th and 10th graders found that, *on average*, 45 percent of respondents found coping with stressful situations at home and school "hard" (29.8 percent) or "very hard" (15.6 percent), 61 percent felt sad and hopeless in the past month either "sometimes" (36.9 percent) or "often" (24 percent); 36 percent felt that they had nothing to look forward to in the past month either "sometimes" (23.0 percent) or "often" (13.2 percent) (8). On all items, females were more likely to report distress than were males (8).

The University of Minnesota survey found that, *on average across grade levels*, up to 28 percent of 7th through 12th graders reported experiencing "extreme stresses and strains"; up to 25 percent reported that they were dissatisfied with their personal lives; up to 23 percent reported that life was uninteresting; up to 26 percent reported that they were tired or worn out; and 19 percent reported that they were not feeling emotionally secure—all in the month before the survey (see 204). These survey results are more or less consistent with those of Offer and his colleagues, who have consistently found that about 1 out of 5 adolescents find adolescence extremely difficult (148).

If one compares adolescents' reports and reports of parents, one finds that adolescents may report more—and different—symptoms than do their parents. It is often difficult to detect these differences because psychiatric epidemiologists often combine the reports of parents and adolescents to come to a single estimate of prevalence (51). Kashani found that there were differences between parents and adolescents in overall prevalence of mental disorders (106a). In addition, parents were more likely to report symptoms of oppositional defiant disorder among their 17-year-olds; the 17-year-olds themselves were more likely to report symptoms pertaining to all other disorders measured (conduct disorder, anxiety disorders, depression, enuresis, and substance abuse) than symptoms of oppositional defiant disorder (106a).

The Minnesota survey distinguished among metropolitan and rural Minnesota adolescents, and also conducted a survey of American Indian and Alaska Native adolescents (see 204). Of the Minnesota adolescents, urban females reported the highest prevalence of subjective distress on three out of five items. Rural males were, however, most likely to endorse the item, "life was uninteresting." Preliminary results of the surveys among American Indian and Alaska Native adolescents found that American Indian and Alaska Native adolescents were much more likely to endorse the statements that "life was uninteresting" (45 percent of males and 41 percent of females), that they were not feeling emotionally secure (43 percent for both males and females), and somewhat more likely to report that they were feeling tired and worn out (23 percent of males and 31 percent of females) (see 204).

Thus, both the level of subjective distress and the level of symptoms of diagnosable disorders reported by adolescents are quite high. As a general matter, diagnosable disorders are more common among male adolescents (51,235), but subjective distress is more common among female adolescents (8,204).

Prevalence of Suicide, Suicide Attempts, and Suicidal Ideation Among Adolescents

As noted in box 11-A, suicide and suicidal ideation are not diagnostic categories included in DSM-III-R. Rather they are behavioral symptoms of underlying problems, many, but not all, of which may relate to the mental health status of an individual.[9]

Despite its seriousness, suicide *appears to be* a relatively uncommon cause of mortality in U.S. adolescents, accounting for about 10 percent of all deaths to U.S. adolescents. In 1986, for example, there were 2,146 cases of suicide reported among U.S. adolescents ages 10 to 19 (220). In contrast, there were 11,231 cases of accidental death in 1986—accounting for 54 percent of all deaths for adolescents in that year.[10] Nonetheless, suicide still

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[9] Despite its inclusion in this chapter on mental health, some observers suggest that suicide may be caused by a variety of factors other than mental illness (e.g., financial pressures, social protest, loneliness). Suicide has been included in the discussion of mental health issues because mental health status is a major contributing factor in many suicides and suicide prevention and treatment interventions are often located within programs for mental health service delivery.

[10] See ch. 5, "Accidental Injuries: Prevention and Services," in this volume for a discussion of morbidity among adolescents due to accidental injuries.

Table 11-2—Suicide Deaths per 100,000 Among U.S. Adolescents Ages 10 to 14 and 15 to 19, 1979-87

	Suicide deaths/100,000 population											
	Ages 10 to 14						Ages 15 to 19					
	Total	Male	Female	White	Black	Other	Total	Male	Female	White	Black	Other
1979	0.81	1.09	0.59	0.91	0.26	1.21	8.35	13.32	3.2	8.92	4.38	12.13
1980	0.76	1.21	0.29	0.86	0.33	0	8.51	13.82	3.02	9.29	3.59	11.02
1981	0.89	1.23	0.54	1.01	0.22	0.79	8.63	13.56	3.54	9.45	3.53	11.28
1982	1.09	1.71	0.44	1.13	0.81	1.29	8.7	14.07	3.15	9.58	3.86	8.26
1983	1.09	1.58	0.57	1.1	1.0	1.23	8.7	13.98	3.24	9.4	4.15	12.32
1984	1.28	1.91	0.63	1.38	0.71	1.51	9.01	14.26	3.54	9.92	3.8	10.12
1985	1.61	2.31	0.87	1.76	0.83	1.62	9.97	15.98	3.73	10.81	4.86	12.07
1986	1.5	2.3	0.66	1.58	0.96	2.05	10.18	16.36	3.76	11.28	4.59	8.36
1987	1.5	2.3	0.6	1.6	1.0	0	10.3	16.2	4.2	11.2	5.8	0.7

SOURCE: U.S. Congress, Office of Technology Assessment, 1991, based on U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Center for Health Statistics, unpublished data on suicide deaths among adolescents, Hyattsville, MD, 1990.

fluctuates between being the second or third leading cause of death among U.S. adolescents, largely because of the relatively sound physical health of this age group.[11]

According to the National Center for Health Statistics in DHHS, the suicide rate among U.S. adolescents ages 15 to 19 has doubled since the late 1960s, from 5.0 suicides per 100,000 in 1968 to 10.3 suicides per 100,000 in 1987 (219a,220). The suicide rate among adolescents ages 10 to 14 has always been much lower than that for 15- to 19-year-olds, but has almost tripled since 1968, from a rate of 0.6 per 100,000 in 1968 to 1.5 suicides per 100,000 in 1987 (219a,220). Suicide rates for U.S. adolescents in the years 1979 to 1987 are shown in table 11-2.

Official suicide statistics are likely to significantly underrepresent the actual incidence of suicide. Holinger and Offer suggest that the numbers of reported suicides among adolescents may very well be two to three times lower than the actual figures (101).

Factors that seem to influence the reporting of death by suicide include the following: 1) variations in medical criteria used to determine cause of death in different jurisdictions, 2) a tendency to discount intentional self-destruction as a cause of death among the young, and 3) practical considerations such as potential loss of insurance benefits and family or community concerns about the stigma attached to suicide (57,96,102). Another factor that may influence the reporting of suicides, especially suicides among children and adolescents, may be the desire to protect families from the distress resulting from a finding of suicide (96,206).

Finally, some suicides may not be recognized as such. Young men in particular may be seen as reckless or impulsive rather than suicidal, especially if their deaths result from falls, drowning, or drug overdoses (158). On the basis of investigations of fatal motor vehicle accidents, some researchers estimate that as many as 10 percent of deaths among adolescents involved in single-vehicle accidents are suicides (75,182,233). Conversely, accidental deaths may sometimes be erroneously classified as suicides (175,153). Currently available postmortem methods for determining suicide are inadequate to determine the extent to which completed suicides among the young are underreported (35,67).

Although the documented increase in completed suicides would suggest a concomitant increase in suicide attempts, little information is available on trends in nonfatal suicidal behavior (96). There is no national reporting system for suicide attempts. Many writers assert that there has been a marked increase in suicide attempts among adolescents in recent years (e.g., 57), although studies that have found increasing rates of suicide attempts among young people have not separated those below the age of 20 from young adults over 20 (110,226,230). One investigation of the proportion of people under age 21 among suicide attempters admitted to a New Haven hospital, however, found an increase between

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[11] Adolescents do have physical health problems that require medical intervention, however. For a review of epidemiologic and other data on the prevalence of physical health problems of adolescents, see ch. 6, "Chronic Physical Illnesses: Prevention and Services," in this volume. For a review of the primary health care services system for adolescents, see ch. 15, "Major Issues in the Delivery of Primary and Comprehensive Health Services to Adolescents," in Vol. III.

1970 and 1975 (230), while a second study in a Boston hospital found no increase in intentional adolescent drug overdoses between 1964 and 1974 (147). The latter study may simply reflect stable rates of intentional drug overdose. It is not known if suicide attempts by other means were also stable during this time period.

Berman and Cohen-Sandler have pointed out that there is little consistency across studies in the criteria used for classifying suicidal behavior or even suicide attempts (22). Only 4 of the 38 studies they reviewed contained operational definitions of suicidal behavior in the sample being studied.

Further, data on attempted suicides are based largely on clinical samples of adolescents admitted to hospitals following suicide attempts. Studies based on clinical samples obviously overlook those suicide attempters who do not come into contact with hospitals. One study found that the number of cases of suicide attempts identified through sources other than hospitals (e.g., jails, private health care providers, social service agencies) was more than double the number identified through hospitals (231). There may also be substantial numbers of adolescent suicide attempters who do not receive treatment. One study found that only 12 percent of the suicide attempters responding to a school-based survey received medical attention following their suicide attempt (179).

Even school-based samples suffer from methodological limitations. Information on suicide attempts from adolescents in a single community (or even a single high school) cannot be generalized to provide accurate estimates of regional or national attempt rates, and school-based samples will necessarily be unrepresentative of the significant numbers of young people who have dropped out of school.[12] Also, the relationship between self-reported attempts and the actual rate of suicide attempts in a population is unknown.

Despite these limitations, local and national school-based studies in offer some insight into the prevalence of suicide attempts among adolescents. In Oregon, 6.2 percent of a sample of high school students reported attempting suicide (11). The 1986-87 Minnesota Adolescent Health Survey found that 7 percent of the males and 14 percent of the females in grades 7 through 12 of that State's public schools reported having attempted suicide at least once (12), while 14.2 percent of a nationwide sample of 8th and 10th grade students reported suicide attempts in a survey by the American School Health Association (8). The differences in estimates may be attributable to variations in the questions or actual differences in the populations represented by each sample.

Prior suicide attempts are predictive of completed suicide among adolescents, but the vast majority of adolescents who attempt or threaten suicide do not actually go on to kill themselves (76,81,137).

Consequences of Selected Severe Mental Health Problems in Adolescence

Mental health problems in adolescence range in seriousness from relatively minor behavioral issues to severely disabling mental illnesses that can be life threatening. Sometimes the comparatively less severe problems, if left untreated, produce long-lasting consequences for social adjustment, self-image, interpersonal relationships, or other factors influencing the quality of life. At other times these less severe mental health problems may not warrant professional intervention. Experience and the maturation process may prove a sufficient remedy (202). Unfortunately, little is known about the short- and long-term consequences of the apparently less severe adolescent mental health problems.

For mental health diagnoses of the more dysfunctional and persistent variety, the consequences are frequently profound for the affected adolescent, the adolescent's family, and society at large. The consequences of serious mental health problems are the focus of the discussion that follows, because something more than passive tolerance is necessary to avoid the potentially devastating results of such disorders.

Consequences for Individual Adolescents

Adolescents with serious mental health problems may be stigmatized by their peers because of odd behaviors, labeled in school as troublemakers, and become alienated from their personal support systems (particularly the family) as a consequence of expressed hostility, inability to communicate effectively, or other factors (83). They may become socially isolated and self-abasing. Their academic performance frequently suffers, and they may exhibit underachievement in other areas as well. The lack of ability to hold a job or interact in other environmental settings can further exacerbate a debilitating mental condition. Encounters with the juvenile justice system may result from antisocial or disruptive behaviors. For some disorders, substance abuse may become a feature of self-medication or comorbidity.[13] Violence toward others or self-inflicted injury or death may follow a descending cycle of pain and depression.[14]

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[12] See ch. 4, "Schools and Discretionary Time," in this volume for information on the numbers of dropouts.

Although there is little research on the relationship between childhood mental disorders and adult mental illnesses, some adult disorders do seem to be preceded by mental health problems in adolescence. In a review of research on the long-term prognosis for adolescents identified as having conduct disorders, Kazdin found that adolescents with conduct disorders had an increased likelihood of later mental health problems, psychiatric hospitalization, and alcohol and drug abuse (107). Kandel and Davies found that the long-term effects of adolescent depression manifest themselves in a reduced ability to establish intimate relationships in young adulthood, with increased use of minor prescription tranquilizers (for women), and with more deviant activities and accidents as young adults (104a). Data from the National Institute of Mental Health (NIMH) in DHHS indicate that several major adult mental disorders, including anxiety disorders and some types of depressive and substance abuse disorders, commonly begin during the late adolescent years (44).

Consequences for Adolescents' Families

Families are the primary caregivers for most adolescents with mental health problems. As caregivers, families are expected to provide food, shelter, and a loving, supportive environment for their adolescent members. But this familial and social expectation is imposed without significant supportive services or respite programs to alleviate the burden it often represents (84,133).

Thus, families seeking to cope with serious mental health problems in adolescents can experience enormous stress (16,43,94). Typically, mental health problems in adolescents are initially discounted by families as "normal" teenage rebellion or "quirkiness." But as symptoms persist, families are frequently forced into behavior patterns that may be destructive of the family unit as a whole.

Mental Health Effects for Parents and Siblings—Parents of adolescents with serious mental health problems may begin to blame themselves or their spouse for failure to provide appropriate discipline or nurturance. Widespread societal ignorance about mental disorders and their causes may reinforce this idea of parental responsibility. Some family therapies also continue to ascribe a causal relationship between faulty parenting and mental disorder in children (93,133). Over time, disputes between parents may yield to estrangement or permanent alienation from one another. Frustration, anxiety, and feelings of hopelessness may accompany life with an adolescent with mental health problems. Unable to cope rationally with their environment, parents may sometimes retreat into substance abuse or violence to relieve unremitted tensions (43,133).

Siblings may encounter similar feelings of guilt and frustration. Some may become overly protective of their mentally disordered brother or sister. Others may withdraw and ignore their ill relative. Many siblings experience fear that they may also have mental health problems in the future. Resentment is common, as family attention focuses—of necessity—almost exclusively upon the adolescent with problems (43).

Financial Costs for Families—Families bear the financial costs of adolescent mental health problems in several ways:

1. They may pay direct out-of-pocket expenses for professional mental health services which may or may not be reimbursed by insurance. Health insurance coverage for mental health services is frequently more limited than coverage for other health services, with higher copayments and deductibles or lifetime or annual benefit restrictions.[15] Benefit structures may also favor a medical model of treatment, driving service utilization in a particular direction that may be more expensive (43).
2. Parents may lose work days because they are needed to supervise, intervene, or participate

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[13] Substance abuse problems in adolescents are discussed in ch. 12, "Alcohol, Tobacco, and Drug Abuse: Prevention and Services," in this volume.

[14] The problem of violence is discussed in ch. 13, "Delinquency: Prevention and Services," in this volume.

[15] For further information on health insurance coverage of mental health services, see ch. 16, "Financial Access to Health Services," in Vol. III.

in their adolescent's educational, therapeutic, or other activities.

3. Families may incur losses from property damaged by the aggressive behavior of an adolescent with a mental health problem or from financial resources spent to cover irresponsible expenditures or provide special assistance to the adolescent in distress. For example, an adolescent with a mental health problem may be aggressive and kick a hole in a wall, break furniture, or wreck the family vehicle (accidentally or intentionally). Or, an adolescent with a credit card may make excessive purchases beyond his or her means, and the family resources may be used to cover the expenditures. Or, a runaway adolescent with bipolar (manic-depressive) disorder may incur expenses associated with return travel when he or she seeks to return home.
4. Siblings may forgo college assistance or other financial benefits as the family struggles to meet mounting costs and allocate limited resources.

Social Costs for Families—Families of adolescents with mental disorders frequently encounter social ostracism. Longtime friendships may be ruined. Certain activities may become off-limits for fear that the adolescent with a disorder may become disruptive or embarrassing. In some families, a siege mentality may develop, and the entire family unit may become isolated and introverted (43).

Consequences for Society

The costs of adolescent mental health problems for society are of two general types: direct costs related to mental health treatment and indirect costs (e.g., losses in productivity, burden on public services). None of these costs have been quantified with a high degree of confidence.

Using the best evidence and method available, OTA estimates that the total cost of mental health *treatment* for adolescents in 1986 may have been $3.5 billion (see below, "Mental Health Treatment Costs" for details).[16]

Quantifying the indirect costs of adolescent mental health problems is even more difficult than quantifying direct costs. Indirect costs include such diverse factors as lost productivity (for both the adolescent and frequently for the family caregiver); increased burdens upon the educational, welfare, police and juvenile justice systems; disorder-related damage to property due to accident or aggression; and impact on homelessness (139). Perhaps one of the greatest indirect costs is the forgone talent and potential contribution to society of an adolescent whose education is interrupted and never becomes what he or she might have been—whether physician or artist, poet or plumber—or worse, whose premature death through suicide deprives society of an unknown future benefit. Value-laden as they are, such costs cannot be estimated, but they are nonetheless significant.

Mental Health Promotion and the Prevention of Mental Health Problems in Adolescents

Mental health promotion and the prevention of mental health problems have been widely espoused as means of averting the devastating costs of adolescent mental health problems on afflicted individuals, families, and society. Furthermore, a broad professional field has developed around these mental health promotion and preventive endeavors. Such endeavors include the following:

- mental health promotion programs to promote positive mental health in the general population;
- primary prevention efforts intended to avoid the onset of specific mental health problems; and
- secondary prevention efforts intended to keep high-risk populations from developing mental health difficulties and to delay the course of a disorder or prevent its recurrence.

This section illustrates the field by focusing on two areas that may be thought of as opposite ends of the spectrum of mental health. It begins by describing programs designed to promote positive mental health (not necessarily prevent specific disorders) among adolescents. Then, it describes programs designed to prevent adolescent suicide, both among the general population of adolescents (i.e., primary prevention) and among high-risk groups, such as those who have attempted suicide (i.e., secondary prevention). Issues relating to evaluating the effectiveness of all mental health promotion and prevention efforts are also discussed.

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[16] Direct costs for treatment of mental illnesses across all age groups have been estimated at $35 billion (139).

Promoting Adolescent Mental Health

It seems almost unnecessary to argue that the promotion of positive mental health among adolescents is a worthwhile endeavor. But the notion that a young person's mental health status can be protected or improved by preventive interventions has been the source of considerable professional and social controversy (e.g., 152b,169). Despite the controversy, there is mounting evidence that adolescents *can* receive supportive services that affect their mental health in a positive way. This section explores some of those approaches and identifies potential problems associated with the promotion of mental health.

The Concept of Mental Health Promotion

While behavioral scientists have not embraced a precise common definition of positive mental health,[17] certain general characteristics are consistent themes in various definitions:

- a sense of overall subjective well-being, despite periodic variations in mood,
- a belief that the self is competent and effective in areas that are personally important to the individual,
- the ability to get along with others in mutually satisfying ways,
- psychological and behavioral flexibility in dealing with stress,
- a sense of personal autonomy and control,
- commitment to personal goals that are valued in one's social environment, and
- a repertoire of behavioral skills needed to solve interpersonal problems and problems of daily living in a competent way (47).

In the discussion to follow, positive mental health is not viewed as the antithesis of mental illness.[18] Rather than being simply the absence of mental disturbance, positive mental health is a concept based on the psychological and emotional competence of an individual to function effectively in his or her environment. While the absence of psychopathology is a necessary condition for positive mental health status, it is not sufficient to ensure the presence of adaptive behaviors or feelings of well-being (2,3). Mental health promotion activities are intended to meet that need.

Mental health promotion seeks to foster a healthy mental equilibrium and maintain emotional stability rather than to restore the effective functioning of an individual with a major mental illness (63). As a result, mental health promotion programs have developed along lines that differ from those of traditional medical models for treating psychopathology.

As Catalano and Dooley have pointed out, a mental health problem may be avoided by either of two means: eliminating the problem *after* onset or intervening *before* onset (42). Positive mental health promotion focuses on the latter approach by concentrating on the healthy population and perhaps those with subclinical manifestations of disorders.

Sound mental health status in adolescents may be fragile and difficult to maintain, given the tremendous physical and emotional changes that occur during this period of life. Individual variables, such as genetic predispositions, biological factors, social and cultural differences, and personality characteristics, can affect both the subjective well-being and the behavioral competence of adolescents. Changing family and peer relationships further complicate the picture. Positive mental health promotion focuses on keeping the well-adjusted adolescent able to function in psychologically healthy ways.

Thus, interventions have been devised to strengthen adolescents' autonomy and ability to cope with stresses, while promoting their self-esteem and appropriate peer relationships. Because of the importance of the educational system in developing academic and interpersonal skills and its convenience as a social unit, schools have served as the primary context for many of the programs to promote positive mental health in adolescents (25).[19] Community mental health centers also have served as program sites in some areas of the country. Less frequently, but still affording largely untapped opportunities, health care settings like health maintenance organizations and family group practices can serve as program delivery sites. The following section examines selected mental health promotion strategies and programs and provides information about their effectiveness.

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[17] One point of controversy is the degree to which an individual should embrace social conventions or behave in socially acceptable ways. Within any pluralistic community, there may be numerous subcultures with competing values. It may be that an individual can function in a way that is congruent with the norms of a particular subculture (e.g., a street gang) and be considered mentally healthy in that context alone, while the same behavior suggests mental health problems from the perspective of society-at-large. This debate on social values is not enjoined in the following discussion.

[18] See ch. 2, "What Is Adolescent Health?" in this volume for a more extensive discussion of the meaning of adolescent health and the various definitions which have been developed. Throughout this Report, OTA uses a broad definition of health that includes the absence of physical or mental pathology but also encompasses behavioral, environmental, and subjective considerations.

[19] The role of schools in adolescents' lives is discussed in ch. 4, "Schools and Discretionary Time," in this volume.

Selected Mental Health Promotion Programs and Their Effectiveness

The most widely used mental health promotion programs have attempted to enhance individuals' social competence and life skills by strengthening their adaptive abilities, reducing stressors, and creating mental-health-promoting environments. These mental health promotion programs are of three types:

- broad-based mental health promotion programs that are delivered as part of a school curriculum,
- programs to help adolescents with a specific risk factor (e.g., parental divorce), and
- programs to prevent a specified problem.

Each of these types is discussed below. The first type is the purest form of mental health promotion. The second and third categories overlap with primary prevention programs because of their targeted nature, even though they use positive mental health program techniques and provide generic mental health benefits beyond their avowed focus.[20]

Broad-Based Mental Health Promotion Programs—Mental health promotion programs that are broad-based and generic are typically implemented as part of a public school curriculum. The aim of these programs has been the development of a set of basic problem-solving and coping skills that can be applied to different types of stressful events. Such programs tend to be designed for delivery to all segments of a particular population (e.g., a particular adolescent age group).

- *Yale-New Haven/Social-Problem-Solving Project (YNH-SPS), the Improving-Social-Awareness/Social-Problem-Solving Project (ISA-SPS), and the Comprehensive Stress Management Program for Children Project*—YNH-SPS (224), ISA-SPS (59), and the Comprehensive Stress Management Program for Children (119) are programs designed to teach children without apparent mental health problems social competence, decisionmaking, and stress management skills. Thus, these programs are generally known as "social-competence-promotion" models. The programs are typically implemented in schools as part of the regular school curriculum. They may involve 8 to 20 sessions conducted by teachers or counselors with special mental health training. Weissberg and others have developed a 6-step response sequence in which YNH-SPS students are asked to: 1) stop, calm down, and think before they act; 2) state the problem and how they feel about it; 3) set positive goals; 4) think of alternative solutions; 5) think of the consequences of each solution; and 6) implement the solution which seems most appropriate (224). Other models have 4-step (15), 8-step (59), or 11-step (88) sequences, reflecting differing views about the appropriate number of sequences to be learned by students at different age levels.

- *Empowerment Models*—A number of different mental health promotion models are based on the concept that adolescents are already basically competent but are impeded from being effective in their environment by social structures or lack of resources. The perceived deficit is that of power to influence the course of one's activities.

  Thus, empowerment models attempt to provide individuals with opportunities to control their own lives. Professionals are engaged not to solve problems before they occur, but to work cooperatively with others to facilitate self-directed solutions. In the educational arena, the Maryland Department of Education's Instructional Leadership Project is an example (135). This program uses a collaborative approach involving students and teachers in instructional decisions.

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[20] Felner and Felner used a different typology to describe the variety of positive mental health promotion programs tried throughout the country (63). In their analysis, mental health promotion programs were identified as being: 1) person-focused; 2) transaction-focused; or 3) environmentally focused. *Person-focused programs* include programs that provide information, assertiveness training, coping skills, interpersonal social problem-solving skills, behavioral skill-building, and reduction of psychological vulnerability. *Transaction-focused programs* include programs that rely on peer support and self-help networks, but also include projects to help children through major life crises or to build abilities for future use (a la Head Start or High Scope-type initiatives). Parent-focused programs like Parent Effectiveness Training belong to this genre, as do educational readiness programs which attempt to match students' educational deficits to remedial supports. *Environmentally focused programs* include efforts to provide social and economic supports for homeless children, nutrition programs, home-based education supplementation programs, and efforts to modify the structure of educational institutions.

Pardes and colleagues suggested yet another typology for mental health prevention programs, categorizing some programs as *universal interventions* intended for all members of a particular population; *indicated interventions* targeted to individuals with clinical or preclinical problems; and *selected interventions*, which focus on high-risk groups (152b).

Programs To Help Adolescents Experiencing a Specific Risk Factor—Mental health promotion programs to assist adolescents in coping with a specified risk factor (e.g., stressful events like parental divorce, school transitions), chronic problems in the social environment, or community problems (e.g., gang violence) are directed toward those portions of the population with epidemiologically established risk factors for mental health problems.[21]

Adolescence may be a stressful time of life. But the sources of adolescent stress appear to vary by age and may thus lend themselves to differing stress-reduction strategies. One study looked at three adolescent age groups and found that family stresses dominated the concerns of 12- to 14-year-olds; peer stresses were uppermost among 15- to 17-year-olds; and academic stresses preoccupied the older adolescents (222). The investigators concluded, "If prevention programs are to be effective in helping youngsters manage stress, they will need to account for the types of stress that are significant for the age group targeted by the program" (222).

- *Children of Divorce Intervention Project*—The Children of Divorce Intervention Project follows the specified risk model of mental health promotion (154). This project is a 16-session, school-based intervention for 4th through 6th grade children whose parents are divorcing. The program focuses on five main goals: 1) fostering a supportive group environment, 2) facilitating the identification and expression of divorce-related feelings, 3) promoting an understanding of divorce-related concepts and clarifying misconceptions, 4) teaching problem-solving skills, and 5) enhancing positive perceptions of self and family (5,154).

Programs To Prevent a Specified Problem—Some mental health promotion programs intended to prevent a specified problem (substance abuse, adolescent pregnancy, or aggressive/antisocial behavior) are focused on high-risk groups, and others are primarily targeted toward individuals who have clinical or preclinical problems. The focus on identifiable problems places programs of this type more appropriately under the broader label of primary prevention than of health promotion, although some programs stress generic mental health maintenance skills that could be taught to a wider audience in a variety of settings.

- *Life Skills Training (LST)*—The LST approach to the prevention of substance abuse is an example of a program that focuses on a particular problem but teaches skills that have broad applicability (26,29). Although it was initially conceived to deal with the harmful consequences of substance use, LST has a broader application because it improves life skills in general and encourages self-directed behavioral change techniques that can be useful in many situations. LST teaches interpersonal skills, mechanisms for coping with anxiety, and promotes independent decisionmaking. A booster program for 8th and 10th graders has also been designed. A detailed teacher's manual gives a complete description of the content and activities of each session. These step-by-step lesson plans permit regular classroom teachers to implement LST after attending a training workshop (29).
- *School Transitional Environment Project*—The School Transitional Environment Project is a program that was designed to reduce the problems experienced by children entering large junior and senior high schools from relatively small feeder elementary schools. Entering students were assigned to a core curriculum with 60 to 80 students. They primarily interacted with their "core" peers in different classes throughout the day, thereby reducing the number of new classmates they needed to meet. Efforts were made to minimize the students' fear and confusion by providing some stability in the school day. Teachers served as administrative links between the school, home, and student, providing counseling and support as necessary (66).

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[21] For a discussion of environmental risk factors for mental health problems in children and adolescents, see OTA's 1986 background paper *Children's Mental Health: Problems and Services* (202).

Effectiveness of Mental Health Promotion Programs—A review of the literature indicates that broad-based mental health promotion programs implemented in schools have demonstrated some success in enhancing the coping skills of adolescents and the ability of adolescents to function in social settings. At this point, though, the link between these gains at specific developmental stages and the long-term maintenance of generally healthy mental status remains unclear.

An evaluation of the YNH-SPS [Yale-New Haven/Social Problem-Solving Project] found that program participants improved their ability to use effective and planned solutions to problems relative to untrained controls (225). Program participants had increased involvement with their peers, improved academic performance, better impulse control, and decreased self-reports of misbehavior.

An evaluation of the ISA-SPS [Improving-Social-Awareness/Social-Problem-Solving Project] found that children who had completed the program, in comparison to a control group of nonparticipants, had increased sensitivity to the feelings of others, greater understanding of the consequences of their actions, and an increased ability to analyze and understand interpersonal situations and plan appropriate actions, according to one assessment (59). Participants also enjoyed a more positive self-concept, were rated by their teachers as better adjusted, showed improved ability to handle the transition to middle school, and were relied upon by their peers for help with problems.

An evaluation of the Comprehensive Stress Management Program for Children found that adolescents who participated in the program, as compared with controls, demonstrated a higher ability to use emotion-focused coping skills and had a decreased perception of stress (48). The elementary school children in the program also self-reported fewer symptoms of anxiety and depression than their control counterparts.

The Maryland Department of Education's Instructional Leadership Project has resulted in heightened satisfaction and feelings of empowerment for both teachers and students participating in the program (135).

Programs with a social-competence-promotion focus that have been targeted to specific risk factors have also shown success. Participants in the Children of Divorce Intervention Project program (relative to controls) have demonstrated reductions in behavior problems and improvement in their school adjustment, according to ratings by children, teachers, and parents (5,154,155).

A number of studies have shown the LST [Life Skills Training] program to be successful in delaying, or perhaps eliminating, substance use. Although the changes have been small, participants in LST programs were found to be less likely than controls to begin smoking cigarettes (30,31,32) or marijuana (28) or drinking alcoholic beverages (27). The extent to which generic life skills are developed during the course of the program is unclear, however (27a).[22]

In 2- and 5-year followups on the School Transitional Environment Project program, participating students were compared with controls in the same schools. The dropout rate for School Transitional Environment Project students was half that of students in the control group. The studies also suggested that School Transitional Environment Project students had higher self-concept and lower incidence of behavioral and emotional troubles, including decreased likelihood of engaging in illicit substance use (62).

Problems in Mental Health Promotion

Problems in Program Design—Compas warns that too little has been done to assess what adolescents', parents', teachers', and other stakeholders' expectations are for the outcomes of positive mental health promotion programs (47). In the absence of such assessments, mental health promotion programs have tended to be designed to provide outcomes valued by mental health professionals; these outcomes may or may not be consistent with the expectations of adolescents and others affected by the programs. If the expectations are not congruent, the effectiveness of the programs may suffer.

The effectiveness of positive mental health promotion programs can also be affected by the site of the program. Shaffer observes that school boards and community mental health centers may fail to implement an intervention appropriately because the organization is not ready to accept the program

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[22] Life Skills Training studies are discussed more fully in ch. 12, "Alcohol, Tobacco, and Drug Abuse: Prevention and Services," in this volume.

(169). The intervention may be inappropriately presented by its supporters, or it may have to be adapted to local conditions, thereby losing, distorting, or damaging necessary or core program elements. Weissberg, Caplan, and Sivo note that many social-competence-promotion programs have originated in elementary schools (225). These authors point out that it is administratively easier to introduce such programs at the elementary school level than at the secondary school level, in part because of the greater stability and structure of the school day (e.g., elementary students typically remain in a single classroom for longer periods of time and classes are smaller and more manageable) (225).

Two additional design-related problems relevant to mental health promotion programs should be noted. First, there is a need to identify what factors contribute to the continuation of successful projects after project funding has ceased. And secondly, there is a need to identify and develop appropriate methods for replicating successful positive mental health promotion models beyond project sites (27a).

Potential Harmful Effects—The promotion of positive mental health among adolescent populations requires careful curriculum design and implementation by properly trained and skillful staff. Programs that assist adolescents in the development of coping, decisionmaking, or other life competencies may occasionally touch upon sensitive topics for individual adolescents. Capable personnel are essential to handle such difficulties and help these adolescents work through their problems.

Some observers have noted that universal interventions, if improperly designed and implemented, can sometimes cause more harm than good (58,79, 124,132). One study demonstrated, for example, that apparently premature application of a preventive intervention to reduce anxiety and aggression actually increased the occurrence of anxiety and aggression in the experimental population (79). In other words, the major risk to the target population seemed to be the intervention itself. While such studies may speak more to the design and implementation of particular programs rather than to the concept of positive mental health promotion itself, they do provide a cautionary note of potential iatrogenic effects and emphasize the need for standards to assure the quality of both program content and staff training.

On the other hand, selected or indicated interventions that require the identification of adolescents at risk raise the disturbing possibility that young people with only minimal symptomatology may be adversely labeled (169). Avoidance of stigmatization is a difficult issue, particularly in school-based programs.

Preventing Adolescent Suicide

Interventions to prevent adolescents from attempting or completing suicide have a less positive focus than many mental health promotion programs. As noted earlier, suicide consistently ranks as the second or third leading cause of death among adolescents (219). Although suicide can result from the interaction of numerous personal and environmental factors and should not be viewed as solely a mental health problem, it is sometimes associated with mental health problems and is considered in this chapter because of its programmatic affinity with mental health services.

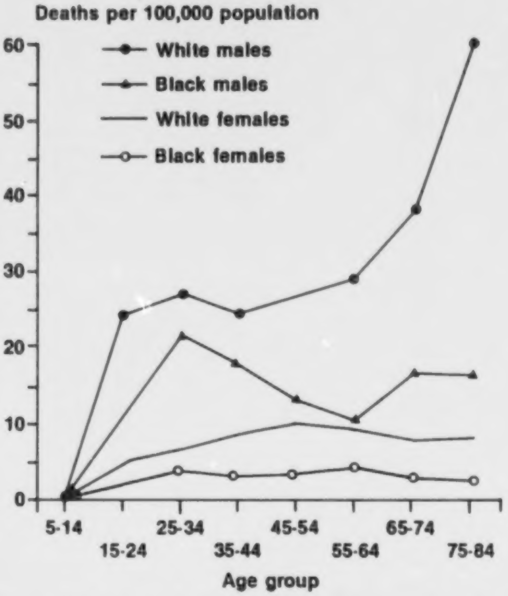
Factors Associated With Suicide Risk

In reviewing reported factors associated with suicide risk, one should bear in mind that most studies of completed suicide in adolescence have, of necessity, included extremely small numbers of subjects. Studies with sample sizes of 30 or fewer, covering a wide range of ages, are common. Few studies have used control or comparison groups. Thus, it is unclear to what extent characteristics found to be common among adolescents who commit suicide are also common among other groups of emotionally disturbed or even normal adolescents.

Individual Factors—As shown in figure 11-1, male adolescents are more likely to commit suicide than females. Females, however, are more likely to make a suicide *attempt*. Estimates of the ratio of adolescent female-to-male suicide attempts have ranged from approximately 2.5:1 (11) to almost 8:1 (184).

Some researchers have theorized that because young women are more likely to attempt suicide without killing themselves, while young men are more likely to complete suicide, males' attempts are indicative of more serious suicidal intent (96,97). Others have theorized that the differences relate to socially approved gender roles which permit females to express themselves through emotional gestures

Figure 11-1—U.S. Suicide Rates by Sex, Race and Age, 1986



SOURCE: U.S. Department of Health and Human Services, Public Health Service, Alcohol, Drug Abuse, and Mental Health Administration, *Report of the Secretary's Task Force on Youth Suicide, Volume II: Risk Factors for Youth Suicide*, DHHS Pub. No. (ADM) 89-1622 (Washington, DC: U.S. Government Printing Office, January 1989).

which males often repress until they reach a more intense level (189). A third reason offered to explain the different suicide rates for males and females is that males are more likely to have access to guns or other lethal weapons which, once used, provide little margin for recanting a suicidal intent. Young women, on the other hand, may select the less lethal means that are more socially acceptable (e.g., prescription and nonprescription drugs) and accordingly be more likely to survive a suicide attempt (130,233).

As figure 11-1 also shows, white adolescents are more likely than black adolescents to commit suicide. White adolescent males have a higher suicide rate than black adolescent males, white adolescent females, or black adolescent females (90,219).

Information on adolescent suicides among other racial and ethnic groups is more limited.[23] Data from national mortality statistics suggest, however, that suicide rates for races other than white and black more closely approximate the rates for white adolescents (208,209). Those aggregate figures obscure the fact that in 1986, American Indian adolescents, although not a monolithic group, generally had a much higher suicide rate—four times higher than all other races among 10- to 14-year-olds (6.9 suicides per 100,000 population among American Indians v. 1.6 suicides per 100,000 population among all other races) and almost $2^{1}/_{2}$ times higher than all other older adolescents (26.3 v. 11.3 per 100,000) (204).

Beyond simple demographic descriptors, a previous suicide attempt is possibly the most important risk factor for completed suicide. Studies of adolescent suicides have found that as many as half had made previous attempts (50,54,168).

Mental health problems are common among adolescents who attempt or commit suicide (190a). In a study of adolescents attending clinics designed to comprehensively serve the health problems of high-risk adolescents and young adults, 25 percent of the suicide attempters could be diagnosed as experiencing major depression (184). Thirty-five percent of the depressed adolescents in the sample had attempted suicide. Several studies have found that as many as a third of their subjects were receiving mental health treatment at the time they committed suicide (50,77,168).

Many of the characteristics of adolescents who commit suicide are also commonly found in adolescents receiving treatment for mental health problems. Thus, potential risk factors may provide clues for early intervention strategies, but they are not specific enough to exclude many *nonsuicidal* adolescents who may be experiencing mental health problems. In a small study, researchers found that suicidal ideation and high levels of hopelessness distinguished between adolescents who had attempted suicide and adolescents with other known risk factors who had not attempted suicide (190a).

Substance abuse problems are also frequently associated with completed or attempted suicide in adolescence (122,160) and suicidal ideation (183,190a). As noted elsewhere in this Report, reports from hospital emergency rooms in major metropolitan areas find that over 60 percent of 10- to 17-year-olds' drug-related encounters are actually suicide attempts (213b).[24] Alcohol consumption is often implicated as a contributory factor in adolescent suicides (173,166).

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[23] The paucity of data on the health status of racial and ethnic minority groups is discussed further in ch. 18, "Issues in the Delivery of Services to Selected Groups of Adolescents," in Vol. III.

Sexual identity issues may similarly increase the risk of adolescent suicide attempts. There is some evidence that gay and lesbian adolescents are significantly more likely to attempt suicide than their heterosexual peers (80,138).

Prior school problems appear regularly among young people who commit suicide, although one study found above average intellectual ability in adolescents who killed themselves (168). It is unclear whether declining school achievement is the result of a common underlying factor or a discrete causal factor in suicide (151a).

Family Factors—Family disruption and parental loss (e.g., divorce, death, abandonment) occur with greater frequency in the families of adolescents who commit suicide than among the general population (50,168). Having a parent with a serious emotional disability or substance abuse problem may also place an adolescent at greater risk of suicide. Adolescents in families where a suicide has been attempted or committed are at a higher risk of suicide themselves, perhaps because of the imitative or role modeling effect or increased genetic risk (168). Although there is very little information available on the relationship between sexual abuse by family members and suicide risk, it has been suggested that sexual abuse may be a contributing factor in suicidal behavior among some adolescents (10).

Social/Environmental Factors—Changes in peer relationships, especially rejection by a boyfriend or girlfriend or a fight with a close peer, seem to place some adolescents at a greater risk of suicide. However, the cause-and-effect relationship in these situations is unclear (166).

Perhaps the most troublesome social factor is the so-called *cluster* effect, where a number of adolescent suicides occur over a short period of time and in close geographical proximity. Having a friend or acquaintance who commits or attempts suicide seems to create a greater risk for vulnerable adolescents (34,87), although one study found no relationship (54). The potential for imitation or copycat suicides may be increased through media accounts of actual or fictional suicide (68,156), but, here again, the research is inconclusive (21,109).

Environmental features such as the relative size of the adolescent population and an increased competition for available jobs also have been hypothesized to influence the adolescent suicide rate. Holinger and Offer suggest that entire generations of adolescents may be placed at relatively greater or lesser risk at different points in time as a result of such subtle interplay between complex environmental factors and individual characteristics (100).

Means of Suicide—The method of implementing a suicide attempt appears to influence substantially the risk of death. As figure 11-2 shows, handguns and other firearms are by far the most commonly used instruments in suicides among adolescents. In 1987, handguns and other firearms accounted for over half of all completed suicides among adolescents ages 10 to 19. The rate of suicide involving firearms increased 225 percent among adolescents ages 15 to 19 between 1968 and 1987, while the rate by other means increased about 180 percent (66). This increase has been hypothesized to be a reflection of increasing accessibility and availability of handguns during this period (33,167).

Overall, the second most frequent method of adolescent suicide is by hanging, strangulation, or suffocation (220). Self-poisoning, through ingestion of solid or liquid substances (e.g., prescription drugs) or inhalation of gases or vapors (e.g., carbon monoxide), constitutes the third most prevalent means of suicide.

Drug overdoses account for the largest proportion (about 38 percent) of adolescent suicide *attempts* that come to the attention of health care providers, although self-inflicted lacerations are almost as high, constituting about one-third of all attempts (75). These methods are followed in prevalence by injuries due to firearms, injuries from jumping from high places, attempted hangings, and carbon monoxide poisoning (75).

Primary Prevention of Adolescent Suicide

Although much has been written about adolescent suicide, knowledge about its causes and effective means for prevention remains extremely tentative. Preventive interventions for adolescent suicide are largely at the formative stage. Although it is unlikely

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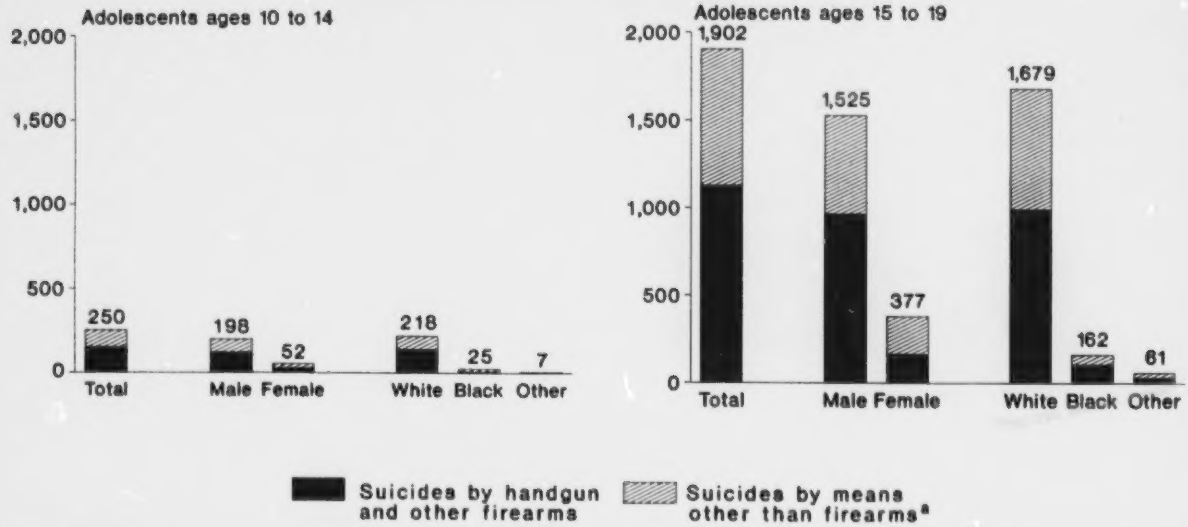
[24] See ch. 12, "Alcohol, Tobacco, and Drug Abuse: Prevention and Services," in this volume.

Figure 11-2—Suicide Deaths Among U.S. Adolescents Ages 10 to 14 and 15 to 19, by Method of Suicide, Sex, and Race, 1987



[a] Means of suicide other than firearms include 1) hanging, strangling, or suffocation, 2) gases and vapors, 3) prescription or nonprescription drugs, 4) ingesting poison, and 5) all other means (e.g., drowning, motor vehicle crashes, jumping from high places, jumping or lying down before a moving object, fire or burns, cutting or piercing injuries).

SOURCE: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Center for Health Statistics, unpublished 1987 data on suicide deaths among adolescents, Hyattsville, MD, 1990.

that adolescent suicide can ever be totally eliminated, innovative primary prevention strategies are being tested in attempts to significantly reduce its incidence. The examples of school- and community-based primary prevention programs below indicate the breadth of those efforts and examine their potential effectiveness.

School-Based Suicide Prevention Programs—The number of school-based programs for suicide prevention has been increasing in recent years. Although there are no current figures on the total numbers of such programs, one survey in 1986 found over 100 school-based suicide prevention efforts which were estimated to reach about 180,000 adolescents, mostly high school students (78). Approximately 44 percent of surveyed programs provided interventions in the elementary grades.

The major goals of these school-based suicide prevention programs were as follows:

- increasing student, teacher, and staff awareness of the problem of adolescent suicide;
- promoting case-finding or identification of potentially suicidal adolescents by teachers or students;
- providing information about existing mental health services in the community; and
- enhancing adolescents' problem-solving and coping skills (171).

Programs may use small discussion groups of targeted students, present information in school assemblies, or integrate suicide prevention into existing curricula. Most programs are not lengthy. In fact, a national survey found that 66 percent of the 115 responding school-based interventions to prevent suicide were only 2 hours or under in duration (78).

Only three systematic evaluations of the impact of school-based primary suicide prevention programs have been identified. One study assessed students 10 weeks after completing a suicide prevention curriculum and found significant but relatively small increases in knowledge and a decrease in feelings of hopelessness (181). The changes this study detected in students' *attitudes* toward the problem of suicide (as distinguished from knowledge or feelings of hopelessness) were attributed to sensitizing from a pretest rather than to the program itself.[25] Another study found that a school-based suicide prevention program had very little impact on students' knowledge or attitudes toward suicide (172). The third study found that participants in a school-based prevention program had significantly higher levels of knowledge about suicide than a pretest group had (144). Attitudes about suicide also shifted, although the magnitude of the difference was small. Changes in suicide rates—the ultimate indicator of a suicide prevention program's effectiveness—were not investigated and would be difficult to demonstrate in relatively small samples like the samples used in these studies.

Unfortunately, the link between changes in attitudes toward and knowledge about suicide and behavioral outcomes is unknown. As Wynne has pointed out, not much is known about the types of information or attitudes that may help protect adolescents against suicidal thoughts or actions (234). Shaffer and his colleagues recently found that self-identified suicide attempters were less likely than non-attempters to endorse views consistent with suicide prevention curricula at baseline, suggesting that suicide attempters may indeed have attitudes toward suicide that differ from adolescents who have not attempted suicide (172a). Unfortunately, Shaffer and his colleagues also found that attempters' views were not influenced in the desired direction by exposure to the suicide prevention curricula, and that in some instances suicide attempters developed attitudes more favorable toward suicide as a solution to life's problems and less favorable toward getting assistance for those problems (172a).

Brief school-based suicide prevention programs may alter adolescents' knowledge or attitudes and strengthen their coping skills, but research has not shown that such programs have an impact on suicidal behavior. In light of evidence that some school-based (172a) and mass-media suicide prevention programs (discussed below) have adverse effects (86), there is some fear that poorly designed programs may have an iatrogenic effect (171).

On the other hand, some evidence suggests that school-based suicide prevention programs may increase the demand for mental health services among adolescents (128). One suicide prevention center that sponsored an intervention found that the number of students contacting the center increased almost threefold following the school-based suicide prevention program, as did the number of requests from school personnel for consultation and assistance with suicidal adolescents (163). Increased demand for mental health services may reflect the effectiveness of a suicide prevention program, or it may be yet another expression of iatrogenic impact in that discussion of suicide may have caused distress among adolescents. Further research is necessary to fully assess these findings.

Community-Based Suicide Prevention Interventions—Beyond the school-based suicide prevention programs, other initiatives have been developed at the community level to focus on the stresses affecting adolescents, with the ultimate aim of reducing suicide risk. Some preventive interventions have been guided by the research that points toward chronic family problems as likely predictors of suicide. These community-based interventions have generally sought to strengthen social supports for families or to the adolescents themselves (96). Other community interventions have focused on identification of adolescents at risk or on improving existing community services for dealing with the mental health needs of potentially suicidal adolescents (171).

Still other community-based interventions seek to increase awareness of the problem of youth suicide and reduce the possible contagion effect of suicides which have already occurred. After a suicide death, for example, some interventions involve efforts to work with target family members and friends of the suicide victim as well as others in the victim's school or community. Such interventions often use trained crisis teams to provide individual and group counseling to suicide survivors (i.e., family and friends). Suicide survivors may also be given information on warning signs for early identification and monitoring of others who may be contemplating suicide (150).

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[25] Students' attitudes toward suicide were measured by agreement/disagreement with statements such as, "Teenagers who try to kill themselves are 'weak' or very disturbed," or "It's none of my business if my friend says he/she wants to kill him/herself or tries to kill him/herself." Knowledge about suicide was assessed by asking respondents to indicate if statements like the following were true or false (the accurate response is given at the end of each statement): "Teenagers who talk about suicide don't kill themselves" (False); "Giving away possessions is a sign that a student may be thinking about suicide" (True); or "If I talk to someone about their suicidal feelings it may cause them to commit suicide" (False).

Little is known about the impact of most community interventions designed to prevent adolescent suicidal behavior. OTA is aware of only one study that evaluated the impact of a community-based program for adolescents thought to be at high risk of suicide. Feldman, Stiffman, and Jung examined support programs for families in which a parent has a substance abuse or mental health problem and found no evidence that such services had any impact on attempted or completed suicide among participating adolescents (61).

Even more discouraging than the lack of evidence for the effectiveness of community-based suicide prevention strategies are the data suggesting that some types of interventions may actually have deleterious effects. A study of the impact of four nationally broadcast television programs dramatizing an adolescent suicide or adolescents' responses to a parental suicide—all of which were intended to increase public awareness and were coordinated with existing community services—found that the incidence of suicidal deaths and attempted suicides among adolescents *increased* significantly following three of the four programs (86). These data suggest that there is still much to be learned about the prevention of adolescent suicide.

Interventions To Reduce Access to Means of Suicide—As discussed above, self-inflicted gunshot wounds are the leading method of adolescent suicide, and medication overdose is the chief method used in suicide attempts (see above). Thus, at least one observer has suggested limiting access to firearms through various gun control measures and to prescription drugs with lethal potential through restrictions on quantities dispensed (41). Holinger has recommended that adolescents who are prescribed antidepressants or other psychotropic medications should also receive an emetic or antidote with the original prescription, since overdoses of such medications are sometimes used in subsequent suicide attempts (100). Strategies for reducing access to other instruments of suicide (e.g., ropes used for hanging or strangulation, gases and vapors, automobiles) have not been devised.

Epidemiological studies have been used to estimate that perhaps as many as 20 percent of all youth who would commit suicide by firearms may be deterred completely by restricting access to guns, and another 50 percent would turn to other, perhaps less lethal, methods (41,100). A comparison between the rates and methods of suicide in King County, Washington, and Vancouver, British Columbia, revealed a higher suicide rate among 15- to 24-year-olds in King County; the higher rate was almost entirely accounted for by the rate of handgun suicide in King County—10 times the rate in Vancouver (178). Possibly, however, social and cultural factors influenced these findings (120).

In the United States, Lester and Murrell looked at the relationship in each State between suicide rates for all ages and the strictness of gun control laws (121). They found that as gun control laws increased in strictness, suicide rates decreased among males. While their findings suggest that strict gun control laws have a preventive effect on males, the correlations may also be related to other factors as yet unidentified and not necessarily imply a causal relationship. It would be difficult, but not impossible, to design several studies to assess more rigorously the impact of reduced access to guns on adolescent suicide.

Holinger has estimated that an additional 3 percent of adolescent suicides could be prevented each year by providing emetics or antidotes along with prescribed antidepressants or psychotropic medications dispensed to adolescents (100). Supporting this view, some have cited legislative restrictions on access to prescription sedatives and hypnotic drugs as the primary reason for the decline in suicide rates in Australia during the 1960s (151). In England, self-asphyxiation with cooking gas declined from accounting for 40 percent of all suicides to less than 10 percent of all suicides by 1971, as a result of the conversion of home heating systems from coke gas (which has a high carbon monoxide content) to natural gas (118). After the conversion to natural gas, suicide attempts increased, but completed suicides remained at the lower level for over a decade (60).

Secondary Prevention of Adolescent Suicide

Secondary prevention programs are programs that seek to prevent suicidal adolescents from attempting suicide or completing or repeating a suicide attempt. These efforts tend to fall into two categories: crisis intervention services and treatment interventions designed to prevent repeat suicide attempts.[26] In addition, the provision of mental health services for all adolescents with mental health problems, as well as those who may be suicidal, has been viewed as a suicide prevention strategy (4,96). These types of prevention efforts and evidence on their effectiveness in terms of preventing adolescent suicide are discussed further below.

Crisis Intervention Services—Adolescent suicide attempts are often impulsive, precipitated by a crisis, and accompanied by serious ambivalence in the wish to die (171), and that observation has led to the development of services that respond to a crisis situation and seek to deter individuals from self-destruction until the immediate crisis has passed. Survey data indicating that adolescents are frequently unaware of suicide prevention services or perceive them to be inaccessible (8) have led to proposals to make those services more readily available and accessible.[27] Most crisis intervention services and suicide prevention centers provide a telephone hot line that is available when traditional mental health services are not (e.g., nights, holidays, and weekends). Some crisis intervention services are staffed 24 hours a day (68). Others provide drop-in counseling or information and referral functions linking clients with existing community services (170). Volunteer workers (including adolescent peers) predominate on the staff of many suicide prevention centers (176).

Studies of hot lines indicate that adolescents constitute only a small proportion of all callers (123). This situation may exist because adolescent suicide attempters are significantly less aware of crisis services than adult attempters (89). It is important to note that hot lines are more accessible to some adolescents than to others; adolescents from impoverished homes may not have phones available to them, they may have less privacy, or they may fear that their parents will discover their call on telephone bills (204b).

Three studies known to OTA evaluated crisis intervention services specifically designed for young people (111,136,177). Two of these focused on hot lines and did not review the broader array of crisis intervention services available in some programs. One of the two found a high level of user dissatisfaction with the hot line called, but it did not determine how many users were suicidal or assess the impact of hot line intervention on subsequent suicidal behavior (177). The second study found that one-fifth of the women and one-third of the men who used a hot line in a college community believe their contact had *worsened* their problems (111). Other users also expressed dissatisfaction with the assistance they received.

The third study that evaluated crisis intervention services found a small but significant reduction in the rate of suicide among young white women in communities which began crisis centers (136). Given that young women are the most frequent users of hot lines (171) and more satisfied with their encounters (111), these results suggest that some crisis intervention services are helpful for certain users.

A 1988 review of the data on general hot lines (not limited to suicide prevention hot lines) concluded that the effectiveness of these services might be improved by greater training of volunteers, combined with standardized procedures and active followup and outreach to suicidal hot line users (171). In addition, the available data suggest that more intensive and directed advertising might make adolescents more aware of crisis services and increase adolescent utilization. Adolescents themselves have suggested that "800" (toll-free) numbers be used for hot lines, so that calls cannot be traced (204b). In the light of negative findings about the effectiveness of some services, it is unclear whether merely increasing awareness and access would have beneficial effects.

Interventions To Prevent Repeat Suicide Attempts—Efforts to keep adolescents who have unsuccessfully attempted suicide from trying again are generally grouped into three categories: inpatient hospitalization, outpatient therapy, and psychopharmacological treatments.

Inpatient hospitalization is perhaps the most common response to an adolescent suicide attempt that comes to the attention of health care providers (129,190). The hospitalization of an adolescent who has attempted suicide is one way to provide an opportunity for intensive assessment of the adolescent's mental health status and of the likelihood of a repeat suicide attempt. It can also allow planning for continued outpatient therapy (96).

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[26] Although the interventions described are part of the mental health treatment system, they are evaluated here as a secondary prevention strategy (to prevent high-risk individuals from making or repeating a suicide attempt).

[27] Almost half of 8th and 10th grade students in the National Adolescent Student Health Survey didn't know whether they could locate a community agency for suicide prevention; about 20 percent said that they could *not* locate such an agency (8).

The most common outpatient therapies following a suicide attempt are family counseling and individual psychotherapy (96). While family support can be important in recovery from an attempted suicide (96), adolescents may resist family involvement in therapy. Further, some families with chronic problems may be resistant to participation. Further, family therapy is not always available, owing to the scarcity of trained family therapists (96).

Very little information is available on the use of pharmacological agents for suicidal adolescents (196). Antidepressants are becoming more common in treating adolescents with major depression, and lithium and monoamine oxidase inhibitors have been used with adolescents who suffer from bipolar disorder (165). Anecdotal evidence suggests that many mental health providers are reluctant to prescribe drugs for adolescents. Reasons for limiting use of pharmacological agents with suicidal adolescents include possible suicidal abuse of medications, the potential for dependence, withdrawal symptoms, and complications associated with concurrent substance abuse (96,165). The new antidepressant, fluoxetine, appears to avoid most of the adverse effects associated with earlier antidepressants. There have been reports of increased suicidal ideation and actual suicides in patients using fluoxetine (193b), but it is far from clear that fluoxetine has been the cause of the suicides (91a). Adolescents have not been involved in trials of fluoxetine for depression (193a).[28]

Generic Mental Health Services—Because of the apparent link between suicide and mental health problems among adolescents, improved screening, diagnosis, and treatment of depression and other psychological disorders have been suggested as a preventive strategy (24). These proposals also seek to increase the ability of health care professionals to detect potentially suicidal adolescents and refer them to appropriate services (191). Access issues have been addressed by recommendations for extended hours, low-cost or no-cost services, and site locations convenient for adolescents, although little has been done to implement such recommendations (19,176).[29]

Overall, there is very little information about the effectiveness of treatment for adolescents who are suicidal (196). In a review of methods of treating suicidal adolescents, Trautman found several studies documenting that adolescents who had attempted suicide had very low rates of keeping outpatient therapy appointments following emergency room treatment or brief hospitalization and high rates of dropout following one or two sessions of outpatient therapy (196). Trautman suggested that cognitive behavioral treatment may be especially effective with suicidal adolescents, given its systematic, highly structured approach and its relatively brief course (196). Although cognitive therapy has been found to be at least as effective as some antidepressant medications with depressed adults (17,197), its impact on suicidal adolescents is unknown (196). Clearly, more research is needed on the treatment of the substantial number of adolescents who appear to be at high risk for suicide.

Services for the Treatment of Mental Health Problems of Adolescents[30]

Perspectives on the Current Mental Health Treatment System for Adolescents

It is somewhat misleading to speak of a mental health treatment system for adolescents. An integrated and well organized mental health system, as such, does not exist for any group in the United States, including adolescents. Instead, one finds a collection of service components which may or may not be linked, organized under different auspices

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[28] In line with its general policy on restricting exposure of investigational new drugs to minors and women of childbearing age, the Food and Drug Administration in DHHS specifically requested that adolescents not be included in clinical trials for fluoxetine during the IND (investigational new drug) stage (193a).

[29] One increasingly popular measure is the placement of comprehensive health services in (or near) schools. As discussed in ch. 15, "Major Issues Pertaining to the Delivery of Primary and Comprehensive Health Services to Adolescents," in Vol. III, mental health counseling has become an integral part of these services.

[30] The sections of this chapter that discuss mental health services are based largely on "Mental Health Services for Adolescents" (39) and "Use of Mental Health Sector Services by Adolescents: 1975, 1980, 1986," both prepared for OTA by Barbara J. Burns, Carl A. Taube and John E. Taube.

(e.g., public, private) and varying in configuration and composition from one part of the country to another.

Despite the lack of an integrated and well-organized mental health treatment system, there have been extensive efforts to implement legitimate systems of mental health care. Significant efforts among these include the child guidance movement and the community mental health center and neighborhood health center movements in the 1960s. In education, the 1975 Education for All Handicapped Children Act (Public Law 94-142)[31] was thought to have the potential to pull together the range of services needed by children and adolescents with disabilities, including mental health problems, through the school system. More recently, the National Institute of Mental Health (NIMH), through its Child and Adolescent Service System Program (CASSP) and the 1986 Comprehensive Planning for Mentally Ill Individuals Act (Public Law 99-660),[32] has been encouraging States to develop comprehensive mental health services for seriously emotionally disturbed children.

The aims of a mental health service system, its operating principles and service components, have been described in the professional literature (187, 202,204). In defining a system of care for severely emotionally disturbed children and adolescents, for example, Stroul and Friedman noted that services should be child-centered, family-focused, and community-based and should include the following components: mental health services, social services, educational services, health services, vocational services, recreational services, and operational services (187).

How reality diverges from the ideal mental health treatment system postulated by Stroul and Friedman becomes evident when one considers data on the utilization of mental health treatment services by adolescents. Fragmentation and lack of coordination are characteristic features of mental health service delivery and are reflected in the segmented, site-specific manner in which utilization data are traditionally considered, with scant attention paid to client movement along a continuum of care (186a).

Utilization of Mental Health Treatment by Adolescents

Sources and Limitations of Data

Many concerns have been raised that children and adolescents do not have appropriate access to mental health services (e.g.,115,202,139). However, it has been difficult to draw firm conclusions about access because of limitations in information about children's use of available mental health services (202). Further, most analyses have focused on children under age 18 as a group and have not disaggregated information about utilization and access for adolescents separately (e.g.,202). This section discusses sources and limitations of current data on the utilization of mental health services by adolescents. It then provides an overview of available estimates of the use of mental health services by adolescents, and draws a tentative conclusion about whether adolescents in need are getting access. Then, using the leading, but quite limited, source of information on mental health services utilization by adolescents —NIMH's Inventory of Mental Health Organizations (208,209,210,211,212)—the section reviews current patterns of utilization by setting and adolescent patient characteristics (e.g., race, ethnicity, diagnosis, source of payment), and reviews shifts in patterns of utilization over the period 1975 through 1986.

There are few sources of data on the utilization of mental health treatment services by adolescents and each source has limitations. DHHS' National Ambulatory Care Survey (NAMCS), a periodic survey of office-based private physicians, provides some information about adolescents' visits to physicians, including psychiatrists.[33] The last NAMCS survey for which data were available for this Report was conducted in 1985. The 1988 National Health Interview Survey (NHIS), also conducted by DHHS, asked respondents to report on whether their chil-

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[31] This was amended in 1990 by the Education of the Handicapped Act Amendments of 1990 (Public Law 101-476).

[32] This was amended in 1990 by the Mental Health Amendments of 1990 (Public Law 101-639).

[33] The methods and limitations of NAMCS are discussed in app. C, "Issues Related to the Lack of Information About Adolescent Health and Related Services," in Vol. I, ch. 6, "Chronic Physical Illnesses: Prevention and Services," in this volume, and ch. 15, "Major Issues Pertaining to the Delivery of Primary and Comprehensive Health Services to Adolescents," in Vol. III.

Box 11-B—Mental Health Service Organizations Surveyed by the National Institute of Mental Health: Definitions

Mental health service organizations surveyed by the National Institute of Mental Health (NIMH) can be split into four levels. Those levels, from the most restrictive to the least restrictive, are defined as follows:[1]

- **Inpatient psychiatric facilities**—Psychiatric inpatient units in State and county mental hospitals, general hospital psychiatric units, and private psychiatric hospitals.
- **Residential treatment centers**—Residential organizations, not licensed as psychiatric hospitals, whose primary purpose is the provision of individually planned programs of mental health treatment services in conjunction with residential care for children and youth primarily under the age of 18. Programs must be directed by a psychiatrist, social worker, or psychiatric nurse who has a master's and/or a doctorate degree. At least half of the admissions must be for mental illnesses that can be classified by DSM-II/ICDA-8 or DSM-III/ICD-9-CM codes other than mental retardation or substance abuse codes.
- **Partial hospitalization/day treatment**—A planned program of mental health treatment services generally provided in sessions of 3 to 6 hours to groups of patients or clients who do not require 24-hour supervision. This level of care offers more intensive treatment than the usual outpatient care (once a week psychotherapy) and provides a range of treatment modalities (individual and group therapy, education, and rehabilitation). Partial care/day treatment can be offered in general hospitals with separate psychiatric services, psychiatric hospitals, freestanding psychiatric outpatient clinics, or multiservice mental health organizations.
- **Outpatient mental health services provided in organized mental health settings**—Mental health services provided to ambulatory patients or clients who do not need either 24-hour supervision or partial hospitalization. As a general matter, outpatient services include the provision of psychotherapy and psychotropic prescriptions in outpatient clinics, crisis services such as home-based treatment, and services in emergency rooms. NIMH only collects data on outpatient services provided in organized mental health settings (e.g., federally funded community mental health centers, freestanding psychiatric outpatient clinics, and multiservice mental health organizations). Information about mental health services provided in private office-based practices and other settings is very limited.

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[1] NIMH does not have a specific definition of a ''mental health organization.'' Rather, it collects data on patient care episodes from eight types of mental health organizations: State and county mental hospitals, private psychiatric hospitals, Department of Veterans Affairs (formerly Veterans Administration) psychiatric organizations, general hospitals with separate psychiatric services, residential treatment centers for emotionally disturbed children, freestanding psychiatric outpatient clinics, freestanding psychiatric partial care organizations, and multiservice mental health organizations. Omitted from the NIMH inventory are patient care episodes in all psychiatric services maintained by Federal agencies other than the Department of Veterans Affairs, such as the Public Health Service, Indian Health Service, Department of Defense, and the Bureau of Prisons.

SOURCE: B.J. Burns, C.A. Taube, and J.E. Taube, ''Mental Health Services for Adolescents,'' contract paper prepared for the Office of Technology Assessment, U.S. Congress, Washington, DC, 1990.

dren had seen psychologists, psychiatrists, or other mental health providers ever and in the past year.[34]

Data on the utilization of mental health services provided by ''specialty mental health organizations'' are available from the National Reporting Program of the DHHS, NIMH, Division of Biometry and Applied Sciences. These data are relied upon extensively in this chapter but are also limited. The types of mental health service organizations surveyed by NIMH are inpatient psychiatric facilities, residential treatment centers, partial hospitalization/ day treatment, and outpatient services provided in organized settings (see box 11-B). Inpatient data are available from NIMH's survey for 1975, 1980, and 1986; residential treatment center data for every 2 years between 1969 and 1983, and then 1986; partial hospitalization data for 1986 only; and outpatient data for 1975 and 1986 (210,211,212).

In 1986, NIMH surveyed 4,747 specialty mental health organizations in the 50 States and the District of Columbia (159).[35] The data from NIMH surveys do not include private office-based mental health services (e.g., provided by primary care physicians, psychiatrists, social workers, clinical psychologists, and nurse-therapists outside the auspices of a clinic or residential setting) and do not include mental health services provided in human service sectors such as health, education, social welfare, and juvenile justice. As discussed briefly in this chapter and elsewhere in this Report, however, mental health services are not typically available in non-mental-health sectors. However, mental health services are provided extensively outside of specialty mental health organizations (e.g., in private practices) by primary care physicians, psychiatrists, psychologists, social workers, nurse-therapists, and other providers. Tremper has estimated the utilization of school psychologists by adolescents (198).

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[34] The 1988 National Health Interview Survey is described, and its limitations discussed, in app C., ''Issues Related to the Lack of Information About Adolescent Health and Related Services'' in Vol. I and in ch. 6, ''Chronic Physical Illnesses: Prevention and Services,'' in this volume. Parents who reported a specific condition were asked whether the child had been treated for the condition ever and in the last 12 months. Parents who had not reported a specific condition were asked ''Has [your child] ever seen a psychiatrist, psychologist, doctor, or counselor about any emotional, mental, or behavioral problem?''

A further source of information is a 1986-87 survey of States conducted by the National Mental Health Association (NMHA), which obtained estimates of children and adolescents in institutional settings (143). Placements made or paid for by different State government entities (mental health, social services, juvenile justice and education) to State hospitals and out-of-state residential treatment centers were reported.

Information about the utilization of some services—e.g., group homes, therapeutic foster care, home-based crisis treatment, emergency rooms, and hot lines—is not collected in any systematic fashion, and their utilization is not discussed below.

Other *potential* sources of information about the receipt of mental health services include data from Education for All Handicapped Children Act programs mandated by Public Law 94-142 (amended by the Education of the Handicapped Act Amendments of 1990 [Public Law 101-476]) (134a), and mental health services provided in school-linked health centers (SLHCs).[36] Mental health services provided under Public Law 94-142 and in SLHCs are discussed below (see "The Public School System").

Estimates of Utilization

The following estimates of adolescents' utilization of mental health services can be made from available data sources:

- NAMCS: 2 percent (1.004 million visits) of visits by 10- to 18-year-olds to private, office-based physicians in 1985 were to psychiatrists (220).
- NHIS: According to parents' reports, 10 percent of all children ages 3 to 17[37] (or an estimated 75 percent of all those who had ever had emotional or behavioral problems) had received treatment or counseling for emotional or behavioral problems at some time in their lives (235). Five percent were reported to have received this help within the previous 12 months.[38]
- NIMH: In 1986, an estimated 1.9 percent of the 10- to 17-year-old adolescent population (586, 845 adolescents) was served by specialty mental health organizations (212). Of the 1.9 percent, 1.3 percent were served by partial hospitalization or outpatient facilities, and 0.6 percent were served in general hospitals, inpatient psychiatric facilities, or residential treatment centers.[39]
- NMHA: States reported to NMHA that, in the year 1986-87, they had placed at least 4,000[40] children (including adolescents) with emotional problems in out-of-State placements, and about 22,000 in State mental hospitals. According to NMHA, "State agencies often do not know the exact number of children they place in out-of-State and in-State psychiatric facilities, the amount of money being spent on their treatment, their diagnosis, or even their whereabouts" (143).

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[35] For those mental health organizations unable to provide patient care episode data on NIMH's inventory forms or during a subsequent telephone followup, data were imputed by NIMH (159).

[36] See ch. 15, "Major Issues Pertaining to the Delivery of Primary and Comprehensive Health Services to Adolescents," in Vol. III.

[37] Data are not available separately for adolescents.

[38] Because complete data are not available on the annual prevalence of mental health problems (that is, the proportion of children and adolescents who experienced an emotional or behavioral problem in the year preceding the survey), it is not possible to determine what percentage of those in need in the last year actually received mental health treatment.

[39] The NIMH data used in this part of the chapter have not been tested for statistical significance, and for further guidance in interpreting the figures presented herein, the reader is cautioned to consult relevant NIMH publications (e.g., 159).

[40] Only a minimum number was able to be estimated, because 14 States were not able to provide complete data to NMHA.

- Public Law 94-142: Of the 341,000 seriously emotionally disturbed individuals ages 3 to 21 identified under Public Law 94-142 in 1986-87, less than one-third received psychological, social work, or counseling services (136a).
- Tremper: An estimated 2 percent of adolescents in any one year may be seen by school psychologists[41] (198).

It is important to note that these estimates from varying sources do *not* allow an overall estimate of mental health services utilization by adolescents, and thus make it difficult to assess possible gaps between service need[42] and access. Of the available sources, probably the best estimate of utilization is from NHIS, because NHIS records the proportion of *children and adolescents* who have had a visit to *any* mental health professional.[43] However, NHIS did not estimate mental health visits separately for adolescents. If one assumes that the level of care for adolescents is the same as that for all 3- to 17-year-olds combined, then one would estimate that, in 1988, 5 percent of all adolescents had had at least some contact with a mental health provider. Because the NHIS relies on parents as informants, and adolescents may seek care on their own without their parents' knowledge, this may reflect an underestimate. There is no national estimate of adolescents' seeking of care for mental health problems on their own.

However useful the estimate based on the NHIS is, NHIS data on mere contact do not reflect the duration (e.g., one visit v. sustained contact over the year), purpose (diagnostic v. therapeutic), or quality[44] of the contact.

Further Examination of Patterns of Utilization Using NIMH Survey Data

As noted above, NIMH data on the utilization of mental health services by adolescents are seriously limited. But despite having numerous limitations, available NIMH data on the utilization of mental health services by specialty mental health organizations serve three useful functions: 1) they enable some examination of current patterns of service use, 2) they allow exploration of the characteristics of adolescents who use each level of care, and 3) they document shifts in patterns of service use over time. Thus, this section is devoted to a detailed examination of NIMH survey data.[45]

Table 11-3—Admissions of U.S. Adolescents Ages 10 to 18 to Specialty Mental Health Care in Organized Settings, by Level of Care, 1986

Level of care	Number of admissions	Percent of admissions	Admissions/ 100,000
Inpatient care	127,351	22%	406
Residential treatment center	44,375	8	141
Partial hospitalization	15,967	3	50
Outpatient care	399,152	68	1,273
Total	586,845	100%	1,870

SOURCE: B.J. Burns, C.A. Taube, and J.E. Taube, "Use of Mental Health Sector Services by Adolescents, 1975, 1980, 1986," contract paper prepared for the Office of Technology Assessment, U.S. Congress, Washington, DC, 1990, based on 1986 data from the U.S. Department of Health and Human Services, Public Health Service, Alcohol, Drug Abuse, and Mental Health Administration, National Institute of Mental Health, unpublished National Institute of Mental Health Inventory of Mental Health Organizations, Rockville, MD, 1989.

Current Patterns of Service Use—NIMH survey data offer some perspective on the relationship between institutional and noninstitutional mental health care. As shown in table 11-3, outpatient mental health services in organized mental health settings accounted for 68 percent of admissions of adolescents to specialty mental health organizations in 1986, with the remainder accounted for by hospital inpatient services (22 percent), residential treatment centers (8 percent), and partial hospitalization (3 percent).

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[41] The number of school psychologists in the Nation's schools is currently estimated at 1 per 2,633 students. Moreover, these psychologists are able to devote only between 5 to 9 percent of their time to direct counseling and therapy (198).

[42] As discussed in the beginning of this chapter, it is difficult to estimate need for mental health services for a number of reasons, including uncertainties about diagnosis for this age group and, in part as a consequence of uncertainties about diagnosis and measurement, the lack of national epidemiological studies.

[43] In contrast, NIMH data pertain to individuals but are limited to care provided in mental health organizations; NAMCS data are limited to visits (in contrast to individuals) to psychiatrists; NMHA data are limited to placements (in contrast to individuals), to residential placements, and to placements made by public entities; and Tremper's data are limited to school psychologists.

[44] In a previous report, OTA defined the quality of medical care as the degree to which the process of care increases the probability of outcomes desired by patients and reduces the probability of undesired outcomes, given the state of medical knowledge" (202a).

[45] For additional details, see B.J. Burns, C.A. Taube, and J.E. Taube, "Use of Mental Health Sector Services by Adolescents: 1975, 1980, and 1986" (39a).

Thus, about 2.4 times as many adolescents receiving mental health treatment in a specialty mental health organization receive care in nonresidential settings (outpatient facilities and partial hospitalization) as are treated in a residential setting (hospital inpatient psychiatric facility or residential treatment center). Of the funding for services in specialty mental health organizations, however, 74 percent goes to residential (overnight) care and 26 percent to nonresidential care (39).

Characteristics of Adolescents in Specialty Mental Health Organizations, 1986—Major demographic and clinical characteristics of adolescents receiving treatment in specialty mental health organizations are highlighted below:

- Male adolescents are much more likely than females to use partial hospitalization (73.2 percent of patients are male) and residential treatment centers (approximately two-thirds are male); gender differences in the use of outpatient services in organized settings and the use of hospital inpatient psychiatric services, however, are less pronounced, with 59.6 percent of outpatients, and 50.7 percent of inpatients, male.
- Racial and ethnic minority adolescents make up a larger share of users of partial hospitalization (24 percent) and residential treatment centers[46] (about 30 percent) than they do of users of outpatient services in organized settings (14 percent) and of inpatient psychiatric services (about 20 percent in State and county mental hospitals and general hospital psychiatric units, and 8 percent in private psychiatric hospitals).
- The most common inpatient diagnosis, accounting for about one-third of inpatient admissions of adolescents in 1986, was affective disorder, followed by adjustment disorder or behavior disorder (depending on the age of the adolescent) (see table 11-4).
- In 1986, the most common diagnosis of adolescents receiving outpatient and partial hospitalization services in mental health organizations was adjustment disorder (accounting for 30 percent of admissions), followed by behavior disorder (about 20 percent of admissions). The two leading diagnoses for 1986 outpatient admissions were followed by either anxiety disorder (5 percent of diagnoses for 10- to 14-year-olds) or substance abuse (11 percent of diagnoses for 15- to 17-year-olds). Affective disorders (16 percent) and substance abuse (9 percent) diagnoses were the third and fourth leading reasons for admission to partial hospitalization in 1986 (for 10- to 17-year-olds combined).

Table 11-4—Distribution of Admissions of U.S. Adolescents Ages 10 to 14 and 15 to 17 to All Inpatient Psychiatric Services, by Diagnosis and Age, 1975 and 1986

	Percent of admissions	
Age, diagnosis	1975	1986[a]
Ages 10 to 14	(N = 25,834)	(N = 38,682)
Mental retardation	1.9%	*
Substance abuse	2.1	*
Affective disorder	10.1	30.6%
Schizophrenia	6.3	*
Anxiety disorder	6.9	11.9
Adjustment disorder	43.9	11.5
Behavior disorder	18.7	26.5
Other	10.4	21.0
Total	100.0%	100.0%
Ages 15 to 17	(N = 54,648)	(N = 68,707)
Mental retardation	2.2%	*
Substance abuse	5.5	9.6%
Affective disorder	15.6	34.0
Schizophrenia	22.4	5.1
Anxiety disorder	4.7	*
Adjustment disorder	25.4	19.5
Behavior disorder	8.2	17.2
Other	16.1	12.1
Total	100.0%	100.0%

[a] Entries marked with an asterisk had five or fewer cases and therefore did not meet standards of reliability or precision.

SOURCE: 1975 data: U.S. Department of Health and Human Services, Public Health Service, Alcohol, Drug Abuse, and Mental Health Administration, National Institute of Mental Health, *Use of Psychiatric Facilities by Children and Youth, U.S., 1975*, DHHS Pub. No. (ADM) 81-1142 (Washington, DC: U.S. Government Printing Office, 1981). 1986 data: U.S. Department of Health and Human Services, Public Health Service, Alcohol, Drug Abuse, and Mental Health Administration, National Institute of Mental Health, unpublished sample survey data, Washington, DC, 1986.

- Involuntary commitment in 1986 occurred for 15 percent of outpatient admissions, for 22

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[46] One reason for the greater minority representation in residential treatment centers may be that most referrals to residential treatment centers are made by entities other than the mental health treatment system, such as the juvenile justice (17 percent), social services (46 percent), and education (28 percent) systems (143).

Table 11-5—Distribution of Outpatient Admissions of U.S. Adolescents Ages 10 to 14 and 15 to 17 in Mental Health Organizations, by Source of Payment, 1975 and 1986

	Percent of admissions	
Age, source of payment	1975	1986[a]
Ages 10 to 14	(N = 134,202)	(N = 206,407)
No payment	25.0	12.3
Personal payment	40.4	30.7
Commercial insurance	9.4	24.4
Medicaid	16.1	21.0
Other government[b]	9.0	*
Other[c]	*	11.5
Total	100.0%	100.0%
Ages 15 to 17	(N = 94,382)	(N = 164,900)
No payment	34.4	12.6
Personal payment	35.5	36.3
Commercial insurance	6.7	22.6
Medicaid	9.5	14.6
Other government[b]	13.5	*
Other[c]	*	13.5
Total	100.0%	100.0%

[a] Entries marked with an asterisk had five or fewer cases and therefore did not meet standards of reliability or precision.

[b] This includes 1986 data for the Civilian Health and Medical Program of the Uniformed Services and Medicare.

[c] This includes social services and State and local sources.

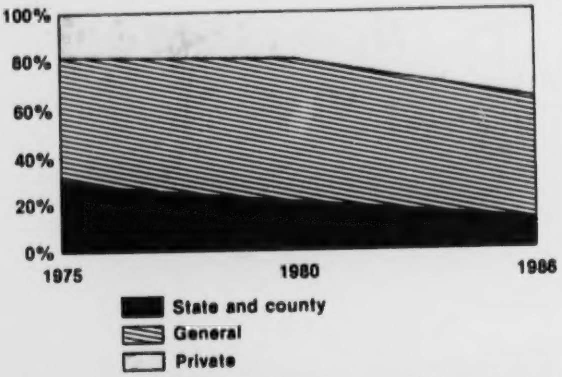
SOURCE: 1975 data: U.S. Department of Health and Human Services, Public Health Services, Alcohol, Drug Abuse, and Mental Health Administration, National Institute of Mental Health, *Use of Psychiatric Facilities by Children and Youth, U.S., 1975*, DHHS Pub. No. (ADM) 81-1142 (Washington, DC: U.S. Government Printing Office, 1981). 1986 data: U.S. Department of Health and Human Services, Public Health Services, Alcohol, Drug Abuse, and Mental Health Administration, National Institute of Mental Health, unpublished sample survey data, Washington, DC, 1986.

percent of partial hospitalization admissions, and for 20 percent of inpatient admissions.[47]

- About two-thirds of adolescents using partial hospitalization and inpatient psychiatric services in 1986 had received prior mental health treatment, in contrast to a third of adolescents using outpatient services.
- Commercial insurance (60 percent) is the most frequently used source of payment for inpatient psychiatric treatment, Medicaid (28 percent) for partial hospitalization, and the patients themselves (33 percent) for outpatient services (table 11-5).

Shifts in Patterns of Service Use, 1975-1986—From 1975 to 1986, the latest year for which NIMH survey data are available, the provision of mental health services to adolescents ages 10 to 17[48] in

Figure 11-3—Distribution of Admissions of Individuals Under Age 18 to Inpatient Psychiatric Services, by Type, United States, 1975, 1980, and 1986



SOURCES: 1976 data: U.S. Department of Health and Human Services, Public Health Service, Alcohol, Drug Abuse, and Mental Health Administration, National Institute of Mental Health, *Use of Psychiatric Facilities by Children and Youth, U.S. 1975*, DHHS Pub. No. (ADM) 81-1142 (Washington, DC: U.S. Government Printing Office, 1981). 1980 data: U.S. Department of Health and Human Services, Public Health Service, Alcohol, Drug Abuse, and Mental Health Administration, National Institute of Mental Health, *National Institute of Mental Health Statistical Note 175*, Washington, DC, 1986. 1986 data: U.S. Department of Health and Human Services, Public Health Service, Alcohol, Drug Abuse, and Mental Health Administration, National Institute of Mental Health, unpublished National Institute of Mental Health Inventory of Mental Health Organizations data, Washington, DC, 1989.

organized mental health settings increased. The greatest increase was in adolescent treatment episodes in residential treatment centers. These increased 66 percent between 1975 and 1986. Adolescent admissions to outpatient services provided in organized mental health settings increased 62 percent between 1975 and 1986, meaning that 170,000 more adolescents were admitted in 1986 than in 1975. Inpatient psychiatric admissions of 10- to 17-year-olds increased 33 percent between 1975 and 1986.

The growth in *inpatient psychiatric admissions* of adolescents since 1975 has been controversial, because it has been largely due to growth in admissions of adolescents to private psychiatric hospitals (229) (see figure 11-3). A small portion of the increase in adolescent admissions to private psychiatric hospitals may be due to decreased use of State and county hospitals for adolescents. Other

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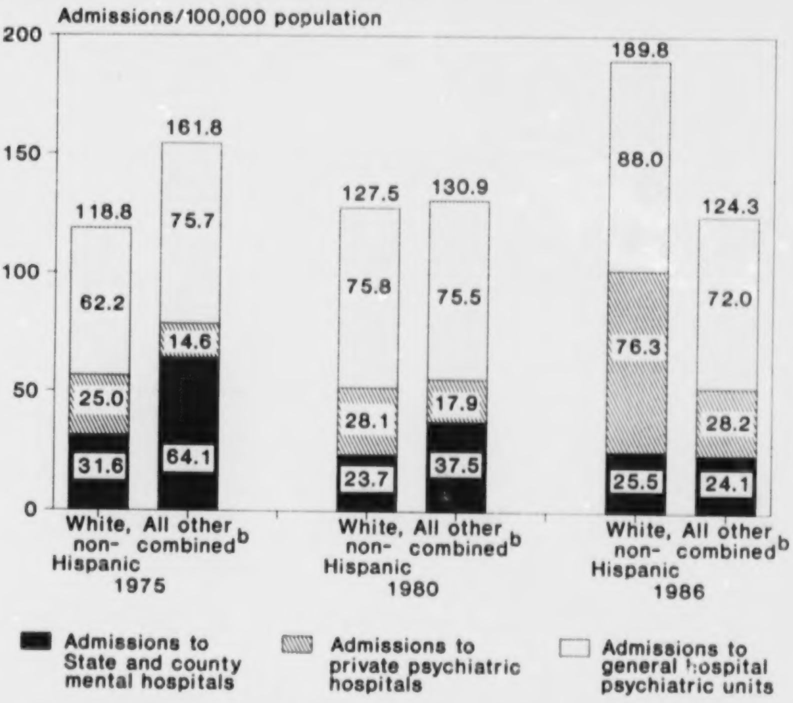
[47] It should be noted that 32 States permit parents to make "voluntary" admissions of a minor, with or without consent of the minor. For further discussion, see ch. 17, "Consent and Confidentiality in Adolescent Health Care Decisionmaking," in Vol. III.

[48] This age group is used for cross-time comparisons because data on 18-year-olds are not available for comparison in 1975 and 1980.

Figure 11-4—Inpatient Admissions to Specialty Mental Health Organizations Among U.S. Children and Adolescents Under Age 18, by Race and Ethnicity, 1975, 1980, and 1986[a]



[a]Breakdowns by race and ethnicity are not available separately for adolescents. In 1986, however adolescents ages 10 to 17 accounted for 96 percent of child inpatient admissions to the organizations surveyed by NIMH.
[b]Finer racial and ethnic breakdowns are not possible for purposes of these calculations.

SOURCE: **1975 data:** U.S. Department of Health and Human Services, Public Health Service, Alcohol, Drug Abuse, and Mental Health Administration, National Institute of Mental Health, *Use of Psychiatric Facilities by Children and Youth, U.S., 1975*, DHHS Pub. No. (ADM) 81-1142 (Washington, DC: U.S. Government Printing Office, 1981). **1980 data:** U.S. Department of Health and Human Services, Public Health Service, Alcohol, Drug Abuse, and Mental Health Administration, National Institute of Mental Health, *National Institute of Mental Health Statistical Note 175*, Washington, DC, 1986. **1986 data:** U.S. Department of Health and Human Services, Public Health Service , Alcohol, Drug Abuse, and Mental Health Administration, National Institute of Mental Health, unpublished 1986 NIMH Inventory of Mental Health Organizations data, Washington, DC, 1989.

explanatory factors may include the following: an increase in mental health problems, such as depression and suicide, among adolescents; decreased stigma and greater acceptance by adolescents and their families of mental health care; increased insurance coverage for inpatient psychiatric treatment; and effective marketing by private psychiatric hospitals.

Other major shifts in patterns of hospitalizing adolescents for mental health treatment from 1975 to 1986 include the following:[49]

- A far greater proportion of the adolescent inpatient population was white, non-Hispanic in 1986 than in 1975 (see figure 11-4).[50]
- Several shifts in inpatient and outpatient diagnoses for adolescents, with large decreases in

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[49] For additional details, see Burns, Taube, and Taube, "Use of Mental Health Sector Services by Adolescents, 1975, 1980, 1986" (39a).

[50] Although the proportion of nonwhite adolescents declined in all types of inpatient facilities for mental health treatment, the greatest decline occurred in State and county mental hospitals (from 30.5 percent nonwhite in 1975 to 18.3 percent nonwhite in 1986) (see figure 11-4). As noted above, however, nonwhite adolescents are less likely than white non-Hispanic adolescents to use private psychiatric facilities.

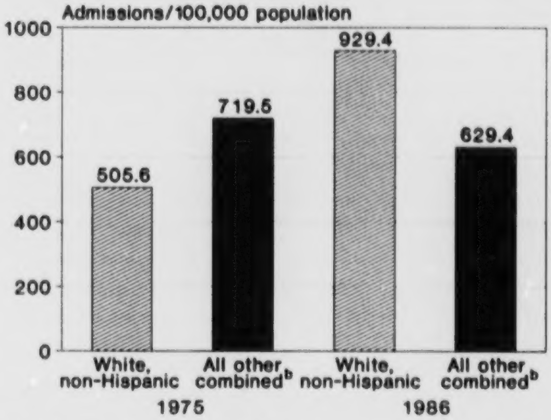
admissions for adjustment disorder[51] and schizophrenia,[52] and large increases in admissions for affective disorder[53] and substance abuse (table 11-4).[54]

- The provision of about 20 percent less individual and group therapy to adolescents in State and county hospitals.
- A major increase in the use of commercial insurance for psychiatric admissions to inpatient settings in conjunction with a reduced role for Medicaid coverage.[55] The change was most pronounced for private psychiatric facilities.[56]
- No significant decrease in the length of stay for adolescents admitted to hospitals for mental health treatment despite the decrease in length of stay observed for adult psychiatric admissions.

The trend toward increased use of *outpatient mental health services* from 1975 to 1986 is probably tied to increased awareness and acceptance of using mental health services as well as better reimbursement by private insurers (39).[57] The proportion of adolescents using commercial insurance for outpatient mental health services in organized mental health settings increased from about 8 percent in 1975 to 24 percent in 1986 (see table 11-5).

The decrease in use of *outpatient and inpatient* mental health services by racial and ethnic minority adolescents may be related to the overall increasing reliance on commercial insurance to fund such services. The rate of use of outpatient services in organized mental health settings by minorities was higher than for whites in 1975, but it dropped below the rate for whites in 1986 (see figure 11-5). In 1986, 20 percent of black, non-Hispanic adolescent outpatients in the NIMH survey used Medicaid; 29 percent made a "personal payment," and 23 percent

Figure 11-5—Outpatient Admissions to Speciality Mental Health Organizations Among U.S. Children and Adolescents Under Age 18, by Race and Ethnicity, 1975 and 1986[a] [b]



[a] Breakdowns by race and ethnicity are not available separately for adolescents. In 1986, however, adolescents ages 10 to 17 accounted for 67 percent of child outpatient admissions to the organizations surveyed by NIMH.

[b] Finer racial and ethnic breakdowns are not available for 1985. Of 1986 adolescent outpatient admissions to specialty mental health organizations, however, 78.4 percent were white, non-Hispanic, 10.1 percent were black, non-Hispanic, 10.1 percent were Hispanic, and 1.4 percent were "other, non-Hispanic."

SOURCE: 1975 data: U.S. Department of Health and Human Services, Public Health Services, Alcohol Drug Abuse, and Mental Health Administration, National Institute of Mental Health, *Use of Psychiatric Facilities by Children and Youth, U.S., 1975*, DHHS Pub. No. (ADM) 81-1142 (Washington, DC: U.S. Government Printing Office, 1981). 1986 data: U.S. Department of Health and Human Services, Public Health Service, Alcohol, Drug Abuse, and Mental Health Administration, National Institute of Mental Health, unpublished 1986 NIMH Inventory of Mental Health Organizations data, Washington, DC, 1989.

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[51] From 31 percent of inpatient admissions in 1975 to 17 percent in 1986, and from 44 percent of outpatient admissions in 1975 to 30 percent in 1986.

[52] From 15 percent of inpatient admissions in 1975 to less than 5 percent in 1986, and from 2.8 percent of outpatient admissions in 1975 to less than 10 sample cases (percentage unable to be calculated) in 1986.

[53] From 11 percent of inpatient admissions in 1975 to 23 percent in 1986, and from 2.6 percent of outpatient admissions in 1975 to 6.6 percent in 1986.

[54] From 4.4 percent of inpatient admissions in 1975 to 6 percent in 1986, and from less than 10 sample cases of outpatient admissions (percentage unable to be calculated) in 1975 to 5 percent in 1986.

[55] In 1975, commercial insurance paid for 44 percent of inpatient care provided to 10- to 14-year-olds and 50 percent of the care provided to 15- to 17-year-olds. In 1986, the percentages paid by commercial insurance were 61 and 67 percent, respectively. In 1975, Medicaid paid for approximately 21 percent of adolescent inpatient care, and in 1986, 11 percent. See ch. 16, "Financial Access to Health Services," in Vol. III for a discussion of the limitations in Medicaid that may account in part for the reduction in Medicaid coverage for inpatient mental health treatment. For example, 13 States (25 percent) do not allow payment for such care. Even States that do pay for inpatient treatment maintain precertification requirements, restrictions on length of stay, and payment rates regarded as unreasonable by some in the psychiatric community (e.g., 194). Low payment is an often cited reason for physicians' lack of participation in Medicaid.

[56] In 1975, Medicaid paid for about 8 percent of adolescent admissions to private psychiatric facilities. In 1986, the number of adolescent admissions paid by Medicaid was too small (five or fewer sample cases) for a statistically reliable estimate to be made.

[57] Although coverage may have improved between 1975 and 1986, mental health benefits are still less generous than many other health care benefits. In the face of rising health care costs, some commercial insurers are now considering placing additional limits on mental health benefits, particularly for adolescent dependents. See ch. 16, "Financial Access to Health Services," in Vol. III.

made no payment; only 7 percent of black, non-Hispanic adolescent users of organized outpatient mental health services used commercial insurance, in contrast to 24 percent of white, non-Hispanic users (212).[58]

An issue which may merit attention is the growth in *substance abuse treatment*. In 1975, not even 1 percent of adolescent outpatients were diagnosed with a substance abuse disorder, but by 1986, 11 percent of 15- to 17-year-old outpatients in mental health organizations were given a substance abuse diagnosis (221). Inpatient admissions of 15- to 17-year-olds for substance abuse disorders also rose between 1975 and 1986, from 5.5 percent to 9.6 percent (see table 11-4). These changes are difficult to interpret.

Effectiveness of the Mental Health Treatment System for Adolescents

Research on the effectiveness of inpatient psychiatric services, residential treatment centers, day treatment and partial hospitalization, and specific therapeutic modalities for adolescents with mental health problems is reviewed below. The review relies heavily on a 1986 children's mental health report by OTA (202), updated with new studies.

Effectiveness of Inpatient Psychiatric Services and Residential Treatment Centers

As described in box 11-B, inpatient psychiatric facilities are in many ways distinct from residential treatment centers. However, there is often much overlap between the two types of facilities, and they have in common the fact that they offer 24-hour residential care for adolescents. In addition, they are often located away from the adolescent patients' home communities (143). Sometimes, residential treatment centers, which are less medically intensive, are located on the same campuses as inpatient psychiatric hospitals, and serve as an interim step between discharge from the psychiatric hospital and release to less restrictive treatments such as partial care, outpatient or ambulatory treatment, or to home. Further, the literature on the effectiveness of inpatient psychiatric treatment does not always distinguish between hospital care and residential treatment center care (202). In this section, the research on the effectiveness of inpatient care refers generally to both hospital care and residential treatment center care. The section then reviews available studies relating specifically to residential treatment center care.

Inpatient Psychiatric Services—Controversy exists over the use of inpatient psychiatric services for adolescents with mental health problems. In 1982, Knitzer reported that at least 40 percent of hospital placements of adolescents with mental disorders were inappropriate, and that these clients could have been more effectively treated in an outpatient setting or in a residential care setting (115). Recently, concerns have arisen with regard to increases in admissions of adolescents to private hospital inpatient psychiatric facilities (229). Judging the appropriateness of this increase in admissions is difficult because of the limited research on the effectiveness of inpatient psychiatric care.

Some researchers suggest that hospital and residential services are no more effective for the majority of adolescents with mental health problems than are outpatient services (70). However, it is difficult to separate effects attributable to particular treatment modalities from effects attributable to particular settings (202). The limited research on the effectiveness of inpatient psychiatric settings for adolescents with mental health problems suggests a critical need for research on this type of care (108,139,155a,202).

In its 1986 report on children's mental health, OTA concluded that "questions about the effectiveness of mental health treatment in psychiatric hospitals and residential treatment centers are difficult to answer because of the lack of systematic research" (202). OTA noted a particular lack of true experiments, or even quasi-experiments, in this area (49,201). True or quasi-experiments would measure treatment outcomes of patients with similar diagnoses and severity of illness placed randomly in either inpatient or ambulatory settings.[59] This approach would allow researchers to begin to distinguish the effects of the treatment settings from those of the clients and other factors. Clearly, however, such experimental research is "complex, difficult, and expensive" (85); furthermore, it is regarded by some as unethical (202).

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[58] Interestingly, 42 percent of Hispanic adolescent outpatients used commercial insurance. Twenty-one percent used Medicaid, 13 percent made a "personal payment," and 20 percent made no payment (212).

[59] Of course, such trials would also maintain some control over (or at least measure) the treatment modalities delivered in the different settings.

At the time of OTA's study, the most comprehensive review of the outcome literature on inpatient treatment for children and adolescents was Blotcky et al.'s 1984 review (23a,202). However, this review and the studies included in it were seriously flawed (202). In 1990, Pfeiffer and Strzelecki attempted to update and improve upon Blotcky's review by reviewing new studies and attempting to conduct a quantitative meta-analysis of outcome studies conducted since 1975 (including those reviewed by Blotcky using a narrative review) (155a). Unfortunately, Pfeiffer and Strzelecki were not able to conduct a true quantitative meta-analysis because only 2 of the 34 studies they found reported the necessary information (155a). In addition, only 4 studies were uncovered that examined the effects of aspects of treatment on outcome. Most studies were concerned with the impact of various patient characteristics (e.g., age, gender, intelligence, pattern of symptoms) on outcome (155a). The aspects of treatment examined in the studies reviewed by Pfeiffer and Strzelecki were: completion of the treatment program; planned discharge; a cognitive-based problem-solving skills training package, and therapeutic alliance (155a).

Using a relatively unrefined method of rating studies for their effectiveness (i.e., a score of +1, 0, or -1, depending on the patients' outcome, adjusted for various factors such as the number of subjects in the study), Pfeiffer and Strzelecki concluded that all 4 treatment studies reviewed found a positive relationship between inpatient treatment and the patients' outcome. Nevertheless, Pfeiffer and Strzelecki noted serious conceptual and methodological shortcomings in the existing literature, including failure to delineate the critical dimensions of inpatient treatment, an absence of consensus on definitions of improvement, a limited range of predictor variables, and failure to use adequate research designs and powerful statistical techniques. Pfeiffer and Strzelecki note that most of the outcome studies they reviewed "had no recognizable research design beyond the modest reporting of one or more measures taken after discharge" (155a). This was the same situation noted by OTA in 1986.

The sole clinical trial of inpatient psychiatric hospitalization for adolescents, conducted in Brooklyn by Winsberg and colleagues, found somewhat better outcomes for adolescents treated primarily in out-of-hospital settings (232). Behavioral and educational outcomes were comparable for both groups. On subsequent followup, though, one-half of the hospitalized cohort were in institutions, and only a quarter of the nonhospitalized adolescents were in institutions. However, these results are difficult to interpret because all patients in the sample were initially hospitalized for a 1- to 3-week evaluation.

Effectiveness of Residential Treatment Centers—The American Psychological Association's Statement on Residential Treatment indicates that there is a lack of consensus in the field regarding which types of adolescents are best treated in residential treatment centers (7). The American Psychological Association reports that current criteria for placement are either too imprecise or too narrowly conceptualized to be used for case-by-case placement decisions. Moreover, it states that no single definition of a residential treatment center exists. Therefore, the decision to place an adolescent in a particular residential treatment center program cannot be reduced to a few universally acceptable criteria.

The research on residential treatment centers consists largely of uncontrolled studies. Two residential treatment center programs merit detailed description because they represent the only programs for which (published) controlled studies were identified. The first, called Project Re-Education (Re-Ed), was started in the early 1960s (99). The aim of Project Re-Ed was to develop a new approach for working with emotionally disturbed children based on educational, psychological, and ecological strategies. Teacher-counselors, backed up by consultant mental health specialists, were trained to work with the emotionally disturbed children and their families. The programs were located in the communities, which facilitated therapeutic work with the family, and the children went home every weekend. Camping was an important component of the program, inspired by the Outward Bound schools in England. The average length of stay was 4 to 8 months, and the program was said to cost about half that of traditional residential programs.

Project Re-Ed has spread in the United States. In 1981, Project Re-Ed programs were located in nine States. Although designed initially for children 6 to 12 years of age, Project Re-Ed has been applied to older adolescents, apparently successfully (99). For example, in a study of Project Re-Ed by Weinstein, comparison groups included 122 emotionally disturbed adolescent males participating in Project Re-Ed, 128 untreated disturbed adolescents, and 128 nondisturbed adolescents (223). The groups were equivalent in age, intelligence, and socioeconomic status. At discharge, the Re-Ed staff rated 94 percent of the adolescents participating in Project Re-Ed as moderately or greatly improved; 18 months after the clients had returned home from Project Re-Ed, their families reported significant improvement compared with adjustment before entering the program. The Project Re-Ed adolescents improved in self-esteem, control of impulsiveness, and internal control.

The only other controlled study of residential treatment center use was conducted by Rubenstein and colleagues in Ontario, Canada (164). In this study, a group of adolescents in a Parent Therapist Program with specially trained foster parents was compared with a similar group treated in a residential treatment center. Both client groups shared comparable backgrounds and made similar progress in their respective treatment programs.

Aside from concerns about the lack of evidence for effectiveness of residential care, there are concerns about the cost of such care (70), the potential for institutional dependence, trauma associated with the separation from the family, difficulty re-entering the family (or even abandonment by the family), and the learning of antisocial or bizarre behavior from intensive exposure to other disturbed children (14). Some have observed that adolescents in inpatient psychiatric and residential facilities may be subject to harsh treatments (e.g., prolonged isolation) (229). No specific standards prohibit such treatments.[60] Research is essential to determine when and for whom the potential benefits of inpatient care and care in residential treatment centers outweigh potential risks.

Effectiveness of Day Treatment[61]

Research on day treatment for adolescents as an alternative to inpatient psychiatric treatment or as followup to inpatient or residential treatment center care suffers from many of the same limitations as research on inpatient care.

Most day treatment programs are like schools with treatment worked into the curriculum (187). The City Lights program in Washington, DC, for example, enrolls adolescents who have been "written off by the schools as unteachable, by the juvenile justice system as intractable, and by the mental health system as untreatable" (195). During the day, the environment is structured, but the patient is allowed to return home at night. This type of care fosters continuing involvement with family and peers. The City Lights program uses self-paced, computer-assisted education in the context of a therapeutic milieu. A long-term evaluation is planned, but initial results suggest that it is possible to keep this population of juveniles in school, to increase their reading and math skills by 1.5 grade levels a year, and to return only 10 percent to hospitals or jails (195). Unfortunately, however, the study on which these promising results are based suffers from the lack of a comparison group.

A Florida day treatment program for emotionally disturbed adolescents emphasizes the development of social skills to deal with peer conflict (e.g., "fair fighting" is taught) and disruptive behavior in ways that promote problem-solving (70). Initial results, which addressed the issue of placements at a 1-year followup, cited reductions in placements to foster care, shelter care, psychiatric units, and settings for delinquents (70).

Reviews of the literature have pointed to positive gains from adolescent use of day treatment in three areas: 1) academic and behavioral improvement, 2) reduction or delay of hospital and residential placements, and 3) a return to less restrictive school placements for about 75 percent of adolescents receiving treatment (13,73). However, as noted above, there have been no methodologically rigorous studies of this type of intervention.

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[60] While there are no restrictions on the use of treatments that may be regarded by some as harsh, the National Association of Private Psychiatric Hospitals, a membership organization of 300 private psychiatric hospitals, does require that each member hospital have written policies and procedures regarding patients' rights (142). These policies and procedures are required to address "the use of high-risk or restrictive procedures, including seclusion, restraint, and behavior modification that employs noxious stimulation or deprivation of nourishment" (142).

[61] A more generic term for day treatment/partial hospitalization is "partial care" (e.g., 159). As defined by NIMH for its inventory of mental health organizations, partial care is a "planned program of mental health treatment services generally provided to groups of clients/patients in sessions lasting 3 or more hours" (159). Included by NIMH as partial care are "day/evening *treatment*" (programs that place heavy emphasis on intensive short-term therapy and rehabilitation), "day/evening *care*" (programs that focus on sustainment, maximization, or socialization through recreation, and/or occupational activities, etc., including sheltered workshops), and "education and training" (programs that focus on change through an integration of education, habilitation, and training, including special education classes, therapeutic nursery schools, and vocational training) (159). Most programs for adolescents are day programs that include education and training. As noted in box 11-B, partial care can be delivered in psychiatric hospitals, freestanding psychiatric partial care organizations, or multiservice mental health organizations.

Day treatment programs are not being used as frequently as they might be because private third-party payers seem reluctant to support this type of treatment (114). Critics claim that day treatment is an ambiguous modality; that it creates demand for services; and that length of stay, treatment outcomes, and costs are unpredictable (114). Research to address the validity of these concerns is needed.

Effectiveness of Therapeutic Modalities

The research on the effectiveness of mental health treatments for children and adolescents was thoroughly reviewed in OTA's 1986 report on children's mental health (202). In general, the studies accumulated considerable evidence suggesting effectiveness for a wide range of treatment modalities for children and adolescents. Most studies reviewed by OTA, however, were plagued by methodological problems.

More recently, a 1987 review of *psychotherapy* outcomes for children and adolescents through age 18 found that, although the overall effect of treatment was positive, therapy was less effective with adolescents than children. Professional training seemed to be more critical for older clients than for children (228).

A subsequent study raised a question about whether the implementation of psychotherapy for children and adolescents in clinic settings is optimal (227). The study compared outcomes for children and adolescents from nine clinics who completed a course of therapy and for those who dropped out after an intake evaluation. The groups were comparable at intake on demographics, family, and clinical measures. Followup evaluations at 6 and 12 months after termination of therapy showed no significant effects of therapy for 6- to 12-year-olds and 13- to 17-year-olds.

Research on the effectiveness of *psychopharmacological agents* has also been reviewed extensively (202). According to Ryan and Puig-Antich, the psychiatric disorders that are responsive to psychotropic medications are similar for adolescents and adults, including schizophrenia, bipolar and unipolar depressive disorder, panic attacks, and generalized anxiety disorder (165). Despite Ryan and Puig-Antich's assurances that adults and adolescents have similar responses to psychotropic medications, the authors are careful to identify a number of caveats because of the very limited research literature specific to adolescents (165). For example, they note that only two studies, with small numbers of subjects, have addressed the effectiveness of tricyclic antidepressants for adolescents; there are no controlled studies on the use of lithium for adolescents; and for anxiety disorders, controlled studies have been done only on separation anxiety disorders. In contrast, the evidence for effective use of stimulants for attention deficit disorder and hyperactivity which continues into adolescence is stronger; the evidence for the use of neuroleptics for adolescents with schizophrenia is also stronger, but special attention to the side effect of tardive dyskinesia is urged as it may occur within 3 months of neuroleptic treatment (165).

Two of the most promising new drugs for mental health problems are fluoxetine (trade name Prozac®) and clozapine (trade name Clozaril®). As noted above, there have been no studies of the effectiveness of fluoxetine for depression in adolescents (193a). Studies are underway, however, on the effectiveness of fluoxetine for obsessive-compulsive disorders, bulimia, and smoking in adolescents (193a). Clozapine is a new drug for schizophrenia that is helping many patients who were previously considered untreatable; however, its availability is raising cost and access issues (114a).

A 1989 Institute of Medicine review of child and adolescent mental health research needs questioned the assumption that the psychiatric disorders that are responsive to psychotropic medications are similar for adolescents and adults (139). The Institute of Medicine noted that animal studies of neurotransmitters revealed markedly different sequences of formation, differentiation, and synaptogenesis (formation of nerve interconnections) of neuronal pathways related to psychiatric areas of interest. The differential development of these neuronal systems were conjectured to correspond with age-related onset of certain psychiatric symptoms in humans. Medications were found to have different effects on these neuronal pathways; for example, stimulants increase motor activity in adults and decrease it in immature animals, and dopamine D-2 receptorblocking antipsychotic drugs exhibit striking differences in effect on behaviors of prepubertal and postpubertal animals. The Institute of Medicine concluded that psychopharmacological interventions have not been adequately studied for short-term and long-term side effects and for both effectiveness and appropriateness to specific age groups.

As did OTA in 1986 (202), the Institute of Medicine in 1987 (139), an NIMH National Advisory Mental Health Council (213) concluded that more research on the effectiveness of a wide range of therapeutic modalities for children and adolescents is critical.

Access to Mental Health Treatment Services

Access to mental health treatment services refers to the ability to get treatment, when needed, at an appropriate level, in a facility which is competent to provide the services at an affordable cost (either financial or psychological). For adolescents to have access to mental health treatment services three requirements must be met:

1) Mental health treatment services must be *available*, meaning that appropriate referrals are made (from either the public or the private sector) and competent clinicians and organizations exist to assess and provide mental health services in the community;
2) Mental health treatment services must be *affordable*, either through insurance, personal resources, or other reasonable means; and
3) Mental health treatment services must be *approachable*, meaning that policy and program barriers (e.g., eligibility requirements) and sociocultural issues (e.g., fears due to stigma or a lack of confidence in treatment) do not hinder use.

The availability, affordability, and approachability of mental health treatment services for adolescents are discussed below. It is important to note that adolescents (and children) with mental health problems face special access issues related to their dependent status. Parental consent is necessary to obtain treatment in most help-seeking situations, and parental involvement is usually required to obtain health insurance coverage.[62]

Availability of Services

Limited availability of mental health treatment services contributes to the access problem. Although an effective mental health treatment system should be able to meet the mental health needs of those who require treatment, serious concerns have been raised about the lack of mental health services for adolescents.

One way to look at the issue of availability is to compare estimates of the need for mental health treatment services with actual use, since a gap between use and need would strongly suggest that adequate services are not available. No national studies have examined the relationship between the need for mental health treatment services based on state-of-the-art psychiatric epidemiological measures and the use of services for the adolescent population.[63] Thus, the only method available to identify the gap between need and use involves applying available prevalence estimates to available mental health service utilization data. These sets of data are, as noted, extremely limited and they do not address issues of intensity, duration, quality, or effectiveness of services. However, if, as estimated above, between 5.6 million (18 percent) and 6.8 million (22 percent) of U.S. adolescents are in need of mental health services, yet only 1.2 million (6 percent) receive such services, then between two-thirds and three-quarters of adolescents do not receive needed services.

Any number of reasons can account for this level of failure in providing mental health services by the mental health treatment system. In some areas, the problem is that mental health treatment services are not available (134,204a). Even nationally, there are fewer mental health professionals specially trained to deliver care to adolescents than are believed to be needed.

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[62] See ch. 16, "Financial Access to Health Services," in Vol. III, for a discussion of health insurance coverage of mental health treatment and ch. 17, "Consent and Confidentiality in Adolescent Health Care Decisionmaking," in Vol. III, for a discussion of parental consent requirements.

[63] The 1988 National Health Interview Survey (NHIS) cited earlier in this chapter asked parents about the existence of an emotional or behavioral problem in their adolescents. The development of a valid diagnostic interview applicable to children and adolescents has proven to be very difficult (139,202). NIMH currently has in the field pilot studies of a diagnostic interview schedule for use in estimating the lifetime and point prevalence of diagnosable mental disorders, and utilization of mental health services, of children and adolescents in the United States.

The question of what constitutes an adequate number of mental health professionals for adolescents is difficult to answer. Such an estimate is made difficult by the fact that both the total number of such specially trained mental health professionals in the United States and standards for provider-to-population ratios are generally not available. The American Academy of Child and Adolescent Psychiatry approximates that 5,000 psychiatrists specially trained to treat children and/or adolescents are currently available (see 204). Approximately 1,400 psychologists have declared an interest in working with adolescents,[64] and 5,150 licensed clinical social workers appear to have a primary interest in treating adolescents (25a), but these data are rough estimates.

In 1981, the Graduate Medical Education National Advisory Committee (GMENAC) recommended to the Secretary of Health and Human Services that 8,000 to 10,000 child psychiatrists (not including other mental health professionals) be available by 1990 (see 204). A GMENAC panel estimated, however, that psychiatrists would be needed to treat approximately 25 percent of the mental health needs of children and adolescents, with the other needs being treated by primary care physicians, pediatricians, and other mental health professionals. Since then, the advisability of primary care physicians' treating mental disorders has been questioned (see 204[65]). Thus, OTA concludes that GMENAC's recommended total number of child and adolescent mental health professionals (including, but not limited to, psychiatrists) could be increased to between 32,000 and 40,000 in 1990. This estimate remains somewhat conservative in that an oversight panel of GMENAC reduced their original recommended projection of child psychiatrists from 25,000 to between 8,000 and 10,000 in part because of "a lack of capacity to train an adequate number of professionals to treat the large unmet need by 1990" (see 204).

These estimates of the need for mental health professionals do not differentiate between the needs of children and adolescents. One indication of differential need is the variation in prevalence of mental health problems. Using current diagnostic criteria for the prevalence of mental health problems, it appears that adolescents are somewhat more likely to require mental health services than are younger children (e.g., 51,235).

In situations where mental health services do exist, barriers to gaining access (e.g., lack of insurance to pay for care, stigma, lack of belief in the value of treatment) may result in low rates of use. Limited coordination of services between the large public and private sector agencies where adolescents receive other services (schools, juvenile justice, health, social services) may also discourage use of mental health services but some evidence suggests that if services were known to be available, they would be used more often.[66]

Affordability of Services

The impact of financial barriers is difficult to examine without information about persons who do not use care because they lack adequate financial resources or insurance coverage. It seems probable, however, that limited insurance coverage may prevent many adolescents and their families from seeking mental health care. A substantial proportion of adolescents (15 percent of 10- to 18-year-olds in 1987) have no health insurance coverage, and the rates of no coverage are higher for Hispanics and blacks than they are for non-Hispanic whites (203).[67] Insured Hispanics and blacks are more likely than whites to be covered by Medicaid, which varies considerably by State in its mental health benefits. In comparison with physical illness coverage under most insurance policies, mental health coverage has more limitations (e.g., higher copayments, annual and lifetime benefit limitations, and greater deductibles). Thus, for many adolescents and their families, cost is likely to be a major issue in access to mental health services.[68]

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[64] See ch. 15, "Major Issues Pertaining to the Delivery of Primary and Comprehensive Health Services to Adolescents," in Vol. III.

[65] Also see ch. 15, "Major Issues Pertaining to the Delivery of Primary and Comprehensive Health Services to Adolescents," in Vol. III, which reports evidence that primary care physicians believe themselves to be not adequately trained to meet the psychosocial needs of adolescents, and that objective studies have found that primary care physicians have difficulty recognizing mental health problems in adolescents.

[66] See ch. 15, "Major Issues Pertaining to the Delivery of Primary and Comprehensive Health Services to Adolescents," in Vol. III.

[67] For a discussion of adolescents' health insurance coverage, see ch. 16, "Financial Access to Health Services," in Vol. III.

[68] For a fuller discussion of issues surrounding insurance and financial access to health care, see ch. 16, "Financial Access to Health Services," in Vol. III.

Approachability of Services

The approachability of the mental health treatment system is a much more complex issue to assess. A recent professional experience related to access to mental health services in a crisis situation involving a suicidal adolescent is described in box 11-C. In this case, getting access to appropriate services at a time of critical need required almost 24 hours. Fortunately, a hot line provided some assurance that help could be obtained, but professional mental health resources were either unavailable, delayed, or believed by some mental health professionals not likely to be constructive (the State hospital). At a minimum, three general hospitals with psychiatric units contacted for help could have offered to arrange a referral to a private psychiatric hospital, but they did not. This kind of system insensitivity is not unusual. When even mental health professionals cannot get the system to work, it is not surprising that families and adolescents, especially those without resources, become extremely frustrated. Little is known about how adolescents view the mental health services system.

The notion that adolescents in many respects require a different *approach* to the delivery of health services in general is coming to be accepted, although a full conceptualization of this approach is yet to be developed and applied.[69]

Shifting to the issue of access to mental health services for minority adolescents, a series of serious consequences associated with minority status and serious emotional disturbance were reviewed by Cross and his colleagues (53):

- There is a tendency to place black adolescents in the juvenile justice system instead of the treatment settings likely to be obtained by their white counterparts (46,95).
- A Native American child is more likely than a white child to go without treatment or to be removed geographically from the family and tribe (20,175,204).
- A Spanish-speaking Hispanic child probably will be assessed in a language that is not his or her own (152).
- An Asian child with a mental health problem is not likely to come to the attention of the mental health system (53).

The preceding observations imply that different approaches to designing or altering the mental health treatment system may be needed to increase access for each minority group.[70]

Box 11-C—An Adolescent Mental Health Crisis Situation Described by a Mental Health Professional[1]

One Sunday evening about 7 p.m., I received a call from parents of an 18-year-old male saying that their son was suicidal (he later admitted to taking an overdose of pain pills shortly before the call). I agreed to find a source of help and called the local general hospital with a psychiatry unit. The hospital staff said they could not handle anyone who was suicidal but that the adolescent could be sent to the State hospital (not an appropriate option for a first episode where the environment would be threatening and only protection from further self-inflicted injury might occur). As the family had insurance, calls were made to two teaching hospitals an hour away from their home. Neither had a psychiatric bed available, and both would have required a 3-hour wait in an emergency room before a psychiatrist could be seen. All that they could offer, after a psychiatric evaluation, was referral to the State hospital.

The only help received that night was an encouraging conversation between the adolescent patient and a volunteer on a suicide hot line. There was no offer of crisis intervention from any of the emergency rooms (other than that a psychiatrist could be called for an evaluation) or any possibility of a home-based team that could come in and work with the family and adolescent. Late the next day, an admission to a private psychiatric hospital was arranged for the adolescent.

[1] This incident was related by B.J. Burns, one of the authors of the background paper on which this section of the chapter is based.

SOURCE: B.J. Burns, C.A. Taube, and J.E. Taube, "Mental Health Services for Adolescents," contract paper prepared for the Office of Technology Assessment, U.S. Congress, Washington, DC, 1990.

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[69] These issues are discussed more fully in ch. 15, "Major Issues Pertaining to the Delivery of Primary and Comprehensive Health Services to Adolescents," in Vol. III.

[70] Ch. 18, "Issues in the Delivery of Services to Selected Groups of Adolescents," in Vol. III, discusses access issues relating to racial and ethnic minority adolescents in greater detail.

Mental Health Treatment Costs

Estimating the costs of treatment for a specific illness within a particular age group is difficult. A 1989 Institute of Medicine study noted that the difficulty in quantifying costs arises from the failure to collect relevant age-specific data necessary to calculate such costs (139). The usual technique is to apply the percent of total admissions that are accounted for by adolescents to total expenditures, within major setting types. This method does not distinguish between unique costs associated with treating adolescents and the costs of treatment for the average patient. It also assumes that the percent of admissions is a reasonable measure of caseload, which is probably more true for short stay facilities than longer stay facilities. Further, according to the Institute of Medicine, the dearth of services for adolescent mental health problems artificially deflates potential costs (139).

Using the best evidence and method available, OTA estimates that the total cost of mental health treatment for U.S. adolescents in 1986 was about $3.5 billion (see table 11-6). Forty-six percent of the total was spent for hospital inpatient care; 28 percent for residential treatment center care; and 26 percent for ambulatory (outpatient) care. Comparing adolescent expenditures with expenditures for other age groups (192), one finds the following:

- Adolescent care includes a major expense category, residential treatment centers, which is not part of the adult costs. The cost and use of residential care has risen dramatically in the past decade. An estimated $359.1 million was spent on residential treatment centers in 1977, increasing to $573 million by 1983. By 1986, expenditures for residential treatment center care rose to $978 million a year, 29 percent of the total costs of adolescent care (192).
- Adolescent costs account for 13 percent of the total specialty psychiatric costs for all ages in 1986, 7 percent of the hospital costs, and 18 percent of the outpatient costs.
- Inpatient hospital expenditures for adolescents are a much smaller proportion of total costs (46 percent) than for all ages (78 percent).[71] However, when residential treatment center costs are added to hospital costs, the percent for institutional costs is 76 percent; 24 percent of costs are for services in the community (outpatient treatment, partial hospitalization).

Table 11-6—Rough Estimate of Direct Expenditures for Mental Health Services for U.S. Adolescents Ages 10 to 18, 1986[a]

	Estimated expenditures in millions
Hospital inpatient, total	$1,592.1
Psychiatric hospital, total	852.4
State	304.9
Private	547.5
General hospitals, total	739.7
Specialty psychiatric units	192.2[b]
Medical units	547.5[c]
Residential treatment centers for severely emotionally disturbed	$ 978.0[d]
Ambulatory care, total	$ 883.3
Organized settings	489.3[e]
Office-based practice	394.0[f]
All specialty mental health facilities, total	$3,453.4

[a] Estimated expenditures were obtained by applying the percentage of admissions of individuals ages 10 to 18 (National Institute of Mental Health sample survey) to the total expenditures for mental health services estimated in C.A. Taube, "Funding and Expenditures for Mental Illness: Persistence of Trends," 1989 (192).

[b] This figure includes all specialty psychiatric units and inpatient units of what the National Institute of Mental Health classifies as "multipurpose mental health organizations."

[c] This assumes the same adolescent percentage as occurs in specialty units.

[d] This assumes 100 percent of expenditures are for adolescents and represents a slight overestimation as residents less than 10 years old, although expected to be a small number, are included in this figure.

[e] This figure includes hospital outpatient programs, free-standing clinics, and other specialty mental health outpatient programs.

[f] This assumes the same adolescent percentage as in organized settings.

SOURCE: B.J. Burns, C.A. Taube, and J.E. Taube, "Mental Health Services for Adolescents," contract paper prepared for the Office of Technology Assessment, U.S. Congress, Washington, DC, 1990.

Coordination Between the Mental Health System and Other Systems of Care

Numerous analyses have concluded that coordination of treatment services for adolescents with mental health problems is the exception rather than the rule (115,127,202). Instead of an orderly provision of appropriate services in a timely manner, one typically finds fragmented services provided across multiple jurisdictions—e.g., mental health systems, social services, schools, juvenile justice, and substance abuse programs. Where linkages between the mental health and other service systems exist, they are generally the result of governmental mandate and encouragement, innovative demonstration projects, or the personal efforts of individual providers. For an adolescent with mental health problems, the only way to get comprehensive—but not necessarily coordinated—treatment may be through application to numerous agencies, each with its own eligibility criteria, legal scope of authority, diagnostic and treatment perspectives, independent resources and benefit structure, and administrative requirements.

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[71] Hospital expenditures for psychiatric care are also about equally split between psychiatric hospitals and general hospitals; however, the costs for adolescents in private psychiatric hospitals represents a larger share of hospital costs (34 percent) than for all ages (12 percent). The cost of hospitalization ranges from $300 to $500 a day (187). This is the most expensive treatment setting available to an adolescent patient with mental illness. In 1988, the per episode cost of private psychiatric hospitalization for adolescents was greater than $16,000 per adolescent (140).

Frustration for adolescents with mental health problems, for their families, and for service providers is a common result of system fragmentation. Because of the difficulty in locating and qualifying for various services, potential beneficiaries may abandon the effort and forgo needed treatment. Parents may be required to relinquish custody of their children (143). Interagency differences and confidentiality requirements may hamper professionals who attempt to create cooperative arrangements to facilitate service delivery or followup on clients in other agencies.

To highlight these problems, brief reviews of the general health care system, the juvenile justice system, the child welfare system, and the public school system, and their interactions with the mental health system, are presented below.

The General Health Care System

Adolescents enter the general health care system—hospitals, emergency rooms, clinics, private physician offices—for a variety of reasons (checkups, illness, accident, disability, substance abuse, pregnancy). But whatever the reason, adolescents who enter the general health care system may also have mental health problems that merit treatment (145). Some adolescents or their families may seek out a general health care provider specifically because of a mental health problem.

Unfortunately, the mental health needs of adolescents entering the general health system are frequently not recognized by the attending physician, nurse, or other provider (38).[72] Even if their mental health needs are recognized, such adolescents may not be appropriately referred. Health care professionals frequently lack state-of-the-art information about diagnosis and treatment of mental health problems and may be unfamiliar with referral resources (38).

To overcome this problem, some health centers have employed specially trained and funded, multidisciplinary teams, although these teams remain rare examples in the general health care field. These teams have been able to detect mental disorders more effectively than traditional health care models (56).[73] Community health centers with a mental health component have demonstrated the value of an interdisciplinary team approach where a full range of services are available within a single agency (37). A Federal effort to coordinate care between community health centers and community mental health centers was never fully implemented because of a shift in policy priorities in 1980 (82,202).

The Juvenile Justice System[74]

For some adolescents with mental health problems, the police or courts may be their first encounter with a public agency. Police may be called upon to intervene in an aggressive act or violation of the law by a minor with a mental health problem; and the court may order a mental health assessment when appropriate. Mental health screening of adolescents involved with the juvenile justice system is not a universal practice, but for those adolescents who are screened and found to have significant problems, a "brush with the law" may be the opening wedge to needed treatment. The courts may not only call upon the expertise of mental health professionals for diagnosis and evaluation, but also may order commitment of adolescents for mental health treatment. The 1989 survey by the National Mental Health Association (NMHA) found that 17 percent of placements of children and adolescents to out-of-State mental health residential treatment were ordered by State juvenile justice systems (143).

The provision of mental health services through the juvenile justice system has not been systematically studied, but it is thought to be limited once disposition of a pending case is made. Interaction between the court and the mental health system is often fragmented and time-limited, but litigation may force changes in this area. A suit brought on behalf of four North Carolina minors (*Willie M. et al.* v. *James B. Hunt, Jr.*), which claimed the four minors had been denied rightful education and appropriate mental health treatment, was settled in favor of the plaintiffs and the class of children "likely to be institutionalized" that they represented (18). This case and similar class litigation may inject the courts into a more visible oversight role vis-a-vis services for adolescents with mental health problems.

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[72] See ch. 15, "Major Issues Pertaining to the Delivery of Primary and Comprehensive Health Services to Adolescents," in Vol. III.

[73] Unfortunately, specially funded adolescent health care teams in this study were no more effective than nonfunded clinics in reducing mental health problems among adolescent clients (56).

[74] For a more extensive discussion of health services for adolescents in the juvenile justice system, see ch. 13, "Delinquency: Prevention and Services," in this volume.

The Child Welfare System[75]

Adolescents tend to enter the child welfare system because of families or environmental factors which place them at risk—e.g., neglect, abuse, or other need for protective intervention. Many adolescents who enter the child welfare system may need mental health treatment. In some States, the child welfare agency may provide its own diagnosis and treatment (whether directly or through referral or purchase of services). In others, the child welfare system may turn to the State mental health authority for diagnosis and treatment or referral. High caseloads for social workers, lack of available services, funding problems, and other impediments may work against appropriate placement and treatment.

Further difficulties arise over legal questions. For example, the Adoption Law and Child Welfare Act of 1980 (Public Law 96-272) has been interpreted differently in different States. Under its provisions, States may require parents to relinquish custody in order to obtain mental health treatment for their adolescent child. Following loss of custody, the adolescent may be removed from the home and community and placed in a residential treatment center (39). In areas where services such as crisis intervention, day treatment, and family preservation services are available, greater cooperation between child welfare agencies and mental health seem to be occurring (116a).

The Public School System

The 1975 Education for All Handicapped Children Act (Public Law 94-142) has provided the potential for stronger linkages between public schools and the mental health sector. This landmark legislation requires a free and appropriate education (and "related services") in the least restrictive setting for all children, including those with mental disorders. Individual education plans are required for all students with disabilities. If mental health services are deemed necessary for a student's educational progress, they must be provided.

Despite the promise implicit in Public Law 94-142, recent research indicates that there are serious limits to mental health services currently available in school settings. As reported by Tremper, there is one school psychologist per 2,633 pupils, and typically school psychologists devote only 5 to 9 percent of their time to direct counseling or therapy (198).

Knitzer recently estimated that only 19 percent of students of all ages with serious emotional disturbance are currently being served under Public Law 94-142 (116). Even among the 341,000 emotionally disturbed 3- to 21-year-olds identified under Public Law 94-142 in 1986-87, an analysis for the U.S. Department of Education found that less than one-third received psychological, social work, or counseling services (136a). Fiscal concerns and other factors have led some States to determine that mental health services do not have to be provided through the schools when they are not directly related to educational objectives (116).

Recently, however, the Education of the Handicapped Act Amendments of 1990 (Public Law 101-476) authorized funding of $35.5 million over 4 years for two new competitive grant programs designed to improve services for children and youth with serious emotional disturbance (20 U.S.C. 1426, Section 627). These grant programs do not go so far as to mandate that mental health be included under "related services," but one grant program is for the use of local educational agencies working in collaboration with mental health entities (20 U.S.C. 1426, Section 627(b)).

Another approach to delivering mental health services to adolescents in schools is through school-linked health centers (SLHCs).[76] The SLHC model for providing comprehensive health and related services to adolescents has received considerable attention and has the potential to reach many underserved adolescents. Definitions of SLHCs vary, and the precise number of SLHCs is not known, but their number has grown in recent years, particularly in the latter half of the 1980s. As the movement to provide health services in or near schools has advanced, SLHCs have found that mental health services are in great demand by students and, on behalf of students, by school faculty and SLHC staff. For example, in the 1988-89 and 1989-90 school years, mental health-related conditions were the second leading cause of clinic visits to the 23 SLHCs funded by the Robert Wood Johnson Foundation, accounting for 20 percent of visits. Mental health visits to these SLHCs were almost as frequent as those for the leading cause of visits, acute illness and accidents (25 percent of visits).

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[75] Adolescents in the child welfare system are discussed in ch. 3, "Parents' and Families' Influence on Adolescent Health."

Although the duration and intensity of the services provided is not known, 90 percent of in-school SLHCs[77] surveyed by the Center for Population Options reported that they provided some level of mental health and psychosocial counseling in the 1988-89 school year. Nonetheless, a group that has been charged by the Robert Wood Johnson Foundation with advancing the provision of mental health services in SLHCs notes that the need for mental health services is far from met, even in schools that have SLHCs (3a).

Barriers to Coordination Between the Mental Health System and Other Systems

Experience has shown barriers to greater coordination and integration of mental health services for adolescents to include the following:

- multiple entry points and jurisdictions;
- lack of interagency linkages, coordination mechanisms, communication, and trust;
- lack of continuity of care over time, as adolescent mental health needs change and are served by different providers;
- the absence of programs specifically designed for adolescents;
- inadequate research on optimum treatment approaches and outcomes;
- the absence of appropriate legislative mandates;
- isolation of providers and lack of information about available services, resources, and funding outside one's own arena; and
- incongruent missions and responsibilities of agencies.

There is not yet a universally accepted model for coordinating and integrating adolescent mental health services with other systems of care. The range of services required by some adolescents is very broad: primary health care, education, legal, social welfare, and mental health. For the most part, each adolescent requiring services must be dealt with on an individual basis by multiple agencies and individuals. Fragmentation of this magnitude limits the ability of systems to provide continuity of care in a comprehensive manner.

These barriers are not insurmountable, but success will require several factors: mechanisms to bring representatives from different systems together formally and informally at the State and local levels, enhanced training for professionals through workshops targeted toward adolescent mental health concerns, greater reliance on case conferences which include all parties concerned with an adolescent's welfare, and similar creative strategies. Innovative approaches are being devised and tested in communities around the country. Selected models of innovative mental health services and model systems of coordinated and comprehensive mental health services are discussed in the sections that follow.

Selected Models of Innovative Mental Health Services

In addition to schools as centers for providing and increasing referrals to mental health services (see above), innovative mental health services include home-based mental health services for disturbed adolescents at high risk of out-of-home placement, therapeutic foster care for adolescents with mental disorders who cannot be managed in their own homes, and therapeutic group homes for emotionally and behaviorally disturbed adolescents. Home-based mental health services are by definition provided in an adolescent's own community, and therapeutic foster care is likely to be provided in an adolescent's own community. As is evident from the discussion below, innovative community-based mental health services are likely to require collaboration among different service systems.

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[76] See ch. 15, "Major Issues Pertaining to the Delivery of Primary and Comprehensive Health Services to Adolescents," in Vol. III, for a discussion of SLHCs, including bibliographic sources for the information discussed here.

[77] SLHCs need not be on school grounds. However, the Center for Population Options survey has to date been conducted only among those SLHCs actually located in schools.

Home-Based Mental Health Services

The goal of home-based mental health services is to preserve the family. Services are provided within the homes of disturbed adolescents and their families on an outreach basis. Home-based services have three primary objectives: 1) to preserve the family's integrity and prevent unnecessary out-of-home placements, 2) to introduce and connect adolescents and their families to community agencies and individuals in order to create an outside support system, and 3) to strengthen the family's coping skills and their capacity to function effectively in the community after crisis treatment is over (185). Only adolescents at high risk of placement in out-of-home settings (e.g., those perceived as dangerous to self or others) are accepted for home-based mental health services.

Home-based mental health services are provided by both public and private agencies. The services are multifaceted, including evaluation and assessment, counseling, skills training, and coordination of services. Program staff usually have caseloads ranging from two to four families, and the length of intervention is typically between 2 to 5 months. Small caseloads are essential to provide immediate and intensive service. Treatment is often provided by a team of at least three professionals. Generally, a primary counselor is assigned to the case, with backup counselors enabling 24-hour coverage. The estimated cost of a three-person program (including secretarial and administrative expenses) has been estimated to range from $120,000 to $160,000 per year (185).

Early demonstrations of home-based services report encouraging results. These include the Homebuilders Program in Tacoma, Washington (112,92); the Systemic Crisis Intervention Program in Houston, Texas; and other home-based services programs in San Diego, California, Hennepin County, Minnesota, and Maine (188). Studies have suggested that 75 to 90 percent of the children and adolescents who participated in such programs did not subsequently require placement outside of the home; verbal and physical aggression decreased; and fiscal savings have been reported (91,98).

An evaluation of the Houston Child Guidance Center's program called the Systemic Crisis Intervention Program followed 75 participating youths over an 18-month period (91). Suicidal behavior was the cause for treatment of 47 subjects (26 of these had suicidal ideation and 21 had actually attempted suicide). No suicide attempts were made during treatment. Among those followed after treatment, there was a significant decrease in the range of problem behaviors. Only 5 of the 75 youths were hospitalized or in residential placement at followup. Two made minor suicide attempts during the followup period. The mean per patient cost of the program was $3,200 per episode of care. Other findings included regular school or work attendance.

The results from evaluations of home-based programs are impressive, but methodological shortcomings exist in most of the research. Few studies have assessed whether families continue to remain intact after home-based services have been withdrawn. If the goal of home-based services is to prevent out-of-home placement, it is essential for the researchers to examine not only the short-term results of intervention but also to conduct longitudinal followup studies. Another problem with available evaluations is that they have not included control families with comparable characteristics and problems for whom home-based services were not provided (193). Without control groups, it is not possible to predict whether comparable adolescents would have entered or avoided out-of-home placement without the intervention.

Despite the preceding cautions, the early evidence indicates that home-based programs, in their short history, have demonstrated that many children who would have been removed from their families can best be served in their homes (72). If a community is committed to a family-oriented system of care that emphasizes treatment in the least restrictive setting possible, in-home services should be tried before out-of-home placements, unless an individual is in immediate danger (12). When intensive services are provided during a time of crisis, they may contribute to lasting improvements in family functioning, and these services may be cost-effective in relation to residential placements (200).

Therapeutic Foster Care

Therapeutic foster care, provided within the private homes of trained families, is a relatively new and specialized form of residential treatment for adolescents with mental disorders who cannot be managed in their own homes. The approach combines the normalizing influence of family-based care with specialized treatment interventions (186). It is the least restrictive of all residential placements for adolescents with mental disorders and is capable of providing individualized, intensive therapy even for adolescents with severe disorders as an alternative to highly supervised institutional settings.

The flexibility of therapeutic foster care programs offers an opportunity to match adolescents to specific social and cultural backgrounds and to design individual treatment programs. No special physical facility is required; therefore, there are no zoning problems when establishing a new program. Therapeutic foster care programs can expand or contract as caseload demands change. All therapeutic foster care programs have a low staff-to-client ratio, allowing the clinical staff to work closely with each adolescent, with the therapeutic foster parents, and, if they are willing and available, with the biological parents. Linkages with schools and other agencies are made.

The estimated annual cost of therapeutic foster care ranges from $10,000 to $20,000 per adolescent (187). Included in this cost are payments to staff and therapeutic foster parents. A portion of the cost of therapeutic foster care programs may be covered by funds for regular foster care in the State. Programs are typically jointly funded by child welfare and mental health agencies, and costs are reported to be lower than for other residential settings (186).

The Presley Ridge Youth Development Extension in Pittsburgh collects annual followup surveys on clients discharged from therapeutic foster care (103). Seventy percent of discharged clients are still living in a less restrictive setting than therapeutic foster care at 1 and 2 years after discharge, and over 70 percent are attending school or are working. When change in functioning is measured over time, behaviors are reported to have improved in more than 75 percent of discharges (103). Friedman reported that significant progress on behavioral objectives was made by 60 percent of youth discharged from Florida's therapeutic foster care programs (69). Snodgrass and Bryant report that an average of 77 percent of children in therapeutic foster homes are discharged to less restrictive settings (e.g., their families, independent living arrangements, less structured group homes) (180).

As noted above, an Ontario study compared outcomes of foster placement in the Parent Therapist Program with care in a residential treatment center (164). Although clients were not randomly assigned, the groups were roughly comparable in background and made similar improvement. The significant difference was that the foster care arrangement was reported to cost only one-half as much as the residential treatment for the same period of time (164).

Although these findings are promising, the research studies on therapeutic foster care are flawed by the same types of methodological problems as are studies on other settings. Therapeutic foster care would seem theoretically to meet the needs of some adolescents more effectively than more institutional alternatives, and some have suggested that the major constraint in developing therapeutic foster care programs has not been lack of enthusiasm about the effectiveness of this type of service, but one of recruiting and training qualified foster parents (40). More research is needed before definitive conclusions can be reached.

Therapeutic Group Homes

Therapeutic group homes can theoretically provide emotionally and behaviorally disturbed adolescents with an environment in which to learn social and psychological skills. In comparison with residential treatment centers, therapeutic group homes are smaller, have fewer medical staff available, and tend to be less security-oriented (187). Such homes typically serve 5 to 10 clients and provide an array of therapeutic interventions.

There are two major models of therapeutic group homes. One is the teaching family model, developed at the University of Kansas, then moved to Boys Town in Omaha, Nebraska (157). The other is the Charley model, developed at the Menninger Clinic. In both models, staff are the key agents for change in the disturbed adolescents; trained couples live at the homes 24 hours a day, with some relief assistance available. Other types of therapeutic group homes may have rotating staff instead of permanent houseparents.

Therapeutic group homes vary with respect to the types of treatment programs they offer, but often combine individual psychotherapy, group therapy, and behavior modification. The teaching family model emphasizes structured behavioral interventions through teaching new skills and positively reinforcing improved behavior. Other types of therapeutic group homes use individual psychotherapy and group interaction. Vocational training, work experiences, and recreation are normally included as part of the treatment program for adolescents.

Some research has suggested that therapeutic group home programs produce positive gains for adolescents while they are in the group home, but that these gains do not appear to be maintained after discharge (113). However, a 1987 dissertation studied changes in relationships between 20 adolescents treated in a therapeutic group home and their parents and peers over an 18-month followup period (162). The study also looked at changes in work relationships and adolescents' level of psychopathology. Twenty untreated adolescents served as controls. At followup, 90 percent of adolescents treated in the therapeutic group home had fair or good relationships, while only 45 percent of adolescents in the untreated group achieved similar ratings. The treated group realized a significant decrease in psychopathology, while the untreated group did not. Future research would benefit from further longitudinal assessments and, perhaps, evaluation of alternative strategies for treatment after discharge from a therapeutic group home. In addition, adolescents with severe character pathology or major psychiatric disorders were not included in the dissertation study, suggesting the need for more analysis of appropriate matchings of clients to treatments (e.g., 202).

Models for the Provision of Comprehensive, Coordinated Mental Health Services

Three models that exemplify successful alternatives to the fragmentation of systems of care for adolescents are the Ventura County Project in California, the Alaska Youth Initiative, and the Kaleidoscope Program in Illinois.

Although they differ in approaches to organizing services, these models of comprehensive services share similar goals and philosophies. All three models are designed to do the following:

- care for adolescents who are at risk of mental health problems or who have been separated from their home and family because of psychiatric hospitalization or placement in mental health residential care;
- maintain and preserve the family of the adolescent as a functioning unit;
- to the extent possible, treat adolescents with mental health problems in their homes and communities;
- maintain the adolescent's personal freedom, responsibility, and participation in normal community activities;
- provide individualized treatment, tailoring the program to meet the specific needs of the adolescent;
- make clinical and therapeutic services available 24-hours a day;
- aid in developing self-sufficiency in the adolescent and family, teaching them the skills to obtain any further aftercare or outpatient services needed, and to live independent and productive lives; and
- encourage and maintain the involvement of multiple agencies in assisting the adolescent clients.

Ventura County Project

The comprehensive service model developed in 1985 in Ventura County, California, is identified as a "satellite model" because multiple public agencies are linked together to provide mental health services to severely emotionally and behaviorally disturbed children and adolescents in decentralized locations throughout the community (104). Agencies involved in the Ventura County demonstration project authorized by the California legislature include mental health, social services, juvenile justice, and special education. Services, staff, and funding are blended together across agencies in order to reach the treatment goals. Case management is provided to ensure that each client receives individual, appropriate, and easily accessible treatment at a low cost. Outcomes are individually monitored for as long as the client receives mental health care. The data are analyzed and used for program improvement.

The Ventura County Project has been reported to decrease rates of out-of-home placement of severely emotionally disturbed adolescents and facilitated earlier return of adolescents to their homes and schools when placement does occur (104). Dowrick estimated that short-term reductions in recoverable

State general fund expenditures have offset costs by more than 50 percent and that the Ventura model will enable California to save almost $17 million a year in State hospital costs (55). Since 1985, out-of-county, court-ordered juvenile justice and social services placements have been reduced by 46 percent in Ventura County, according to Dowrick (55). OTA did not attempt to validate these estimates, but, if true, the model could be promising.

Alaska Youth Initiative

The Alaska Youth Initiative provides highly individualized mental health services to severely maladjusted children and adolescents in Alaska (36). The Alaska Youth Initiative was created by the State government to bring young people placed out of State back to Alaska and to limit out-of-State placements for children, adolescents, and young adults between the ages of 7 and 20 years of age. The Alaska Youth Initiative is called a "wraparound" service system. The dollars available to buy services are allocated to the community by the State government. The service package is developed by the child or adolescent's case manager and is purchased from vendors. Both the funds and the services are "wrapped around" the child or adolescent, providing the most individualized treatment and education possible. The essential concepts are flexible funding and flexible service delivery. When a service for a given child or adolescent is not available from an existing organization, funds are used to develop the service. For example, instead of bringing an adolescent male with schizophrenia from a remote village into Anchorage for treatment, a mental health consultant was flown to his village to work with the school and family to set up a community-based program for the boy (55).

An interdepartmental team, consisting of staff in the State Department of Education, the Division of Mental Health and Developmental Disabilities, and the Division of Family and Youth Services, manages the Alaska Youth Initiative and evaluates the strengths and gaps in the continuum of services in the communities. Regional coordinators organize local treatment and education teams that devise the individualized service plans for each youth. On average, 4.3 agencies are represented on an individual treatment team, although participation may range from 3 to 7 agencies at a time with one case.

For each child served by the Alaska Youth Initiative, the average yearly cost is reported to be $40,562 (including administration, direct service, and State education costs) (55). This cost may seem high, but costs in residential treatment centers would have been closer to $50,000 to $75,000 per year. Costs for an adolescent in his or her second year of the program are estimated to be 24 percent less than first year costs. The average length of participation in the Alaska Youth Initiative is 11.8 months.

Initial outcomes (as of January 1989) from the first and second years of the Alaska Youth Initiative are encouraging. Almost half of the young people participating in the Alaska Youth Initiative were diverted from out-of-State placements and remained in Alaska. Two of these youth subsequently required out-of-State placement, one short-term. The amount of time spent with natural families or in family-like care, as opposed to institutional care, increased. Runaway episodes among participants decreased by 75 percent and substance abuse declined. Assaultive behavior, property damage, contacts with police, and suicide attempts were almost eliminated. Medication compliance, school attendance, and parental involvement were also reported to have improved (55).

The Alaska Youth Initiative approach seems most appropriate for isolated or sparsely populated rural areas because it permits an infusion of resources and expertise to maintain community-based alternatives to more institutional and centralized services. There are plans to systematically produce long-term client outcome data on each severely emotionally disturbed child and adolescent being served by the Alaska Youth Initiative. Further, this model has been extended to other States (Washington, Montana, and Wyoming), where client outcomes are also being monitored (39,55).

Kaleidoscope Program

The Kaleidoscope Program, a private umbrella organization in Chicago, offers a continuum of services for adolescents with diagnosable mental disorders and members of their families (185). Support for the Kaleidoscope Program comes from the Cook County Region of the Illinois Department of Children and Family Services, from other regions of that department, and from the Joint Services Children's Initiative of the Illinois Department of Mental Health. Additional support includes funds contributed by the private sector and from fundraising.

The underlying philosophy of treatment at Kaleidoscope is normalization and unconditional provision of care. Adolescent clients are treated in a normal environment so that they may learn from their surroundings. All adolescents referred to the Kaleidoscope Program are accepted provided there is an opening (185).

Three basic program models are provided by Kaleidoscope: 1) therapeutic foster care (see above); 2) a youth development program, which places and supervises older adolescents in apartments in the community and helps them live on their own, and 3) satellite family outreach, which reunites adolescents placed in residential treatment with their families and prevents the unnecessary removal of adolescents from their families.

The adolescent clients' regular caregivers—parents, child care workers, or foster parents—are the Kaleidoscope Program's key resources for treatment. They provide around-the-clock care and are in charge of the client's treatment plans. Mental health professionals are available for specialized treatment and consultation.

Kaleidoscope staff provide child care, diagnostic assessments, and a wide range of therapeutic services. About 70 staff and 45 professional foster parents are employed. All staff have at least a bachelor's degree, and about 20 have master's degrees.

The home-based services provided to Kaleidoscope clients are estimated to cost approximately $1,200 per month (185). The average 18-month episode is estimated to cost $21,600 (185).

Kaleidoscope has not yet formally evaluated the program's effectiveness but has estimated that at least 50 percent of adolescents referred for services are maintained outside of the residential placement system for a minimum of 18 months (185). When clients are discharged, at least 50 percent of their families require less intensive services at followup (185). Research support for additional evaluation seems warranted.

More information about innovative financing alternatives to financing and coordinating mental health services for adolescents will be forthcoming from the Robert Wood Johnson Foundation (161) and NIMH (186a,213a).

Major Federal Policies and Programs Pertaining to Adolescent Mental Health

Historically, most public mental health prevention, promotion, services, and treatment have been the exclusive domain of State and local governments, with no discernible Federal role beyond research and research training. It was the movement to deinstitutionalize persons with mental illnesses that caused a shift in Federal policies, focusing attention on the need for a community-based infrastructure for mental health services.

Passage of the Community Mental Health Centers Act (Public Law 88-164) in 1963 promised a stronger Federal presence in the mental health arena. In 1981, however, this law was superseded by the law establishing the alcohol, drug abuse, and mental health (ADM) block grant, placing more responsibilities on States and local communities (see below). Generally, national engagement in child and adolescent initiatives at the Federal level has remained fragmented and erratic. In its 1989 report on child and adolescent mental health research, the Institute of Medicine observed:

> Problems of children are of potential interest to many Federal agencies. For example, the Department of Education addresses problems of children with emotional or developmental difficulties that interfere with learning; the Office of Children, Youth, and Families in DHHS has programs for delayed and deprived children, including Head Start; Maternal and Child Health in HRSA [DHHS' Health Resources and Services Administration] works to prevent problems and has especially close ties to pediatrics; the Justice Department must cope with children who violate societal norms; and other agencies deal with issues of developmental disabilities, rehabilitation, and entitlement programs. However, none of these agencies have shown a strong or consistent interest in children and adolescents with severe mental disorders (139).

Although, as the Institute of Medicine noted, there are extensive roles for the Federal Government to play in improving the mental health of adolescents, this chapter emphasizes major Federal programs related to financing of mental health treatment for adolescents. Federal activities related to the coordination of services for adolescents with mental health problems, and research on adolescent mental health issues. An overview of the Federal role in adolescent health is provided elsewhere in this Report.[78]

Financing of Mental Health Treatment for Adolescents

Medicaid

The major vehicle for Federal financial involvement in adolescent mental health—the Medicaid program—is not primarily a mental health program nor is it targeted specifically to adolescents. Rather, Medicaid (Title XIX of the Social Security Act) is a joint Federal/State program for financing general health care services for families (and some individuals) who meet certain eligibility criteria.[79] Covering an estimated 4.5 million individuals ages 10 to 18 and representing approximately 55 percent of all public health funds spent on children and adolescents, Medicaid is the major health care financing mechanism for low-income adolescents. A Medicaid program is available in every State except Arizona, where a special waiver program is in effect.

Medicaid is managed at the State level, and the Federal Government gives States considerable latitude in decisions about what services to cover, what eligibility standards to apply, and what limitations to impose on services. Some services, including hospital and physician services, are mandatory, while other services are optional. States have substantial flexibility in financing mental health services are generally among those services. Thus, for example, individual States are permitted to cover the services of psychologists or inpatient psychiatric services for persons under age 21 but are not required to do so. As of 1989, 38 States covered inpatient care in freestanding psychiatric facilities; 10 permitted reimbursement for residential treatment centers which have not been specifically certified as psychiatric facilities; and 18 States covered partial hospitalization as a mental health service.[80] The Health Care Financing Administration in DHHS, which administers Medicaid, estimates that 10.5 percent of Medicaid expenditures on behalf of adolescents ages 10 to 18 in fiscal year 1988 were for hospital-based mental health services. Outpatient mental health benefits vary among State Medicaid programs and also fluctuate depending upon the treatment setting and provider. Estimates of Medicaid expenditures on outpatient mental health treatment for adolescents are not available. Medicaid restrictions can make it difficult to provide the kind of comprehensive, coordinated case that may be needed by low-income adolescents covered by Medicaid.

A potentially important reform under Medicaid occurred in the Omnibus Budget Reconciliation Act of 1989 (Public Law 101-239), when Congress refined the Early and Periodic Screening, Diagnosis and Treatment (EPSDT) Program. EPSDT mandates States to conduct periodic screenings for treatable conditions of Medicaid-eligible children and adolescents, with appropriate followup, referral, and treatment. The 1989 amendments would override any State-imposed Medicaid coverage limitations on conditions discovered during screening for which medical treatment is necessary and allowable under the Federal guidelines. Thus, an adolescent with a mental health problem detected during an EPSDT screening could obtain necessary mental health services under Medicaid, notwithstanding a State Medicaid standard which would have restricted such services. As far-reaching as the EPSDT reforms may become, it is still too early to assess their impact. EPSDT reforms will not help the one out of three poor adolescents not covered by Medicaid (203).

Alcohol, Drug Abuse, and Mental Health Block Grant

The Alcohol, Drug Abuse, and Mental Health (ADM) Block Grant Program is unlike Medicaid in that it was developed specifically to help States finance mental health and substance abuse treatment. Enacted in 1981 as Public Law 97-35, the ADM Block Grant Program is administered at the Federal level by the Alcohol, Drug Abuse, and Mental Health Administration in DHHS. It is currently the only Federal program that provides funding to States for the support of outpatient community mental health services. ADM block grant funds cannot be used for inpatient institutional care.

For fiscal year 1990, Federal ADM block grant funds totaled $1.133 billion. Of the total, $237.5 million was allocated for mental health services and

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[78] See ch. 19, "The Role of Federal Agencies in Adolescent Health," in Vol. IIII.

[79] For more information on Medicaid eligibility rules, see ch. 16, "Financial Access to Health Services," in Vol. III.

[80] See ch. 16, "Financial Access to Health Services," in Vol. III.

$895.6 million was allocated for substance abuse programs.[81] Both parts of the ADM block grant are subject to 10 percent set-asides. Ten percent of the substance abuse funds must be used for services to pregnant women and women with dependent children. Ten percent of the mental health funds must be set-aside for new programs for underserved populations, with a priority given to severely emotionally disturbed children and adolescents (105). In 1986, OTA noted that the ADM block grant set aside for mental health services for children was so small that its significance was more symbolic than substantive (202).

Coordination of Mental Health Services for Adolescents

Child and Adolescent Service System Program (CASSP) of NIMH

A relatively small, but important, program in the area of adolescent mental health is the Child and Adolescent Service System Program (CASSP) administered by NIMH. CASSP was created by Congress in 1984 to promote greater coordination among public and private agencies providing services to children and adolescents with mental health problems (202).

Since 1984, CASSP has provided 47 States with technical assistance, training programs, and planning grants (126). States receiving CASSP grants are required to have a child mental health authority and mechanisms for interagency coordination of services involving mental health, juvenile justice, social services, and related agencies; family participation; and culturally sensitive programs. In fiscal year 1990, Federal funding for CASSP was approximately $9 million, essentially the same level of funding as in the previous year. From that amount, CASSP is funding 45 State grants for State and local systems development demonstrations and launching several new research-oriented programs (126,186a).

The State Comprehensive Mental Health Services Plan Act

CASSP's efforts at the State level have been complemented by a recent Federal planning initiative which, even though originally targeted toward adults, has helped focus attention on adolescent mental health services. In 1986, Congress enacted the State Comprehensive Mental Health Services Plan Act (Public Law 99-660), mandating each State to develop—with the advice of mental health consumers, their families, and other advocates—a comprehensive plan to serve the needs of seriously mentally ill individuals. The emphasis under the original act was clearly on services for seriously mentally ill adults, although services for children and adolescents were expected to be a part of each State's plan.[82] The Mental Health Amendments of 1990 (Public Law 101-639), passed in late 1990, imposed a requirement that States cover children and adolescents in their comprehensive plans.

The State Comprehensive Mental Health Services Plan Act created a small grant program to provide resources for technical assistance to the States during the course of the 3-year planning process, but appropriations were cut back from the statutory minimum grant level in each of the first 2 years and completely eliminated in the third year. The State plans developed under Public Law 99-660 were approved by NIMH in mid-1990. Compliance monitoring of implementation also will be conducted by NIMH, and States will be expected to submit progress reports documenting substantial implementation in September 1991.

The Education for All Handicapped Children Act

For adolescents still in school, the Education for All Handicapped Children Act (Public Law 94-142), has sometimes proven useful in obtaining needed mental health services. This act requires all public school systems to provide free and appropriate education together with "related services," in the least restrictive environment, for children and adolescents with physical or mental handicaps. Some school jurisdictions have interpreted the "related services" provision as requiring them to provide mental health care, while other local educational authorities have excluded the provision of such care from their obligations under Public Law 94-142. Such uneven application of mental health services to the mental health needs of children and adolescents has been a cause of concern (205). As noted above, recent amendments to Public Law 94-142 are intended to improve the delivery of special educational and related services to seriously emotionally disturbed adolescents.

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[81] The substance abuse component of the ADM block grant is further divided—35 percent of the funds must be devoted to alcohol abuse programs, 35 percent must be used for drug abuse programs, and the remaining 30 percent may be used in a discretionary manner for the overall substance abuse prevention and treatment field.

[82] NIMH requested States to include these populations in their plans.

NIMH estimates that Public Law 94-142 provided $63.6 million in fiscal year 1983 expenditures for both direct educational and related services (e.g., transportation, support, counseling, assessment, diagnostic, and medical services) to mentally ill children and adolescents (131). An additional $23.5 million was paid to assist previously institutionalized students and for educational support for students in State-operated or -supported mental health institutions under another related act, the Education Consolidation and Improvement Act of 1981 (Public Law 89-313).

Research on Adolescent Mental Health Issues

Three recent studies have evaluated the Federal commitment to adolescent and child mental health research and found it wanting.

In 1986, an OTA study on children's mental health found that Federal research efforts on child and adolescent mental health were seriously underfunded (202). OTA's study recognized that the Federal Government was virtually the only source of funds for such research and suggested that children's mental disorders was a prime example of an area with missed research opportunities.

In 1988, at the request of NIMH, the Institute of Medicine initiated a study of mental, behavioral, and developmental disorders among children and adolescents. The following year, its report, *Research on Children and Adolescents' Mental, Behavioral, and Developmental Disorders*, faulted NIMH for failure to exert leadership in relation to child and adolescent mental disorders and called for a 5-year plan to increase NIMH's funding for child and adolescent mental health research and research training to $162 million (139).

Following release of the Institute of Medicine's study in 1989, Congress asked NIMH to develop a plan delineating how it would expand basic, clinical, and services research in the area of children's mental health. In 1990, the National Advisory Mental Health Council of NIMH released its *National Plan for Research on Child and Adolescent Mental Disorders* (213). A conclusion in that document was that the Nation was "doing far too little to develop the scientific knowledge needed to treat or prevent" mental illness among young people (213). After recounting several recent advances in research, the document noted that NIMH had not been able to provide the level of support necessary to sustain and build upon those advances. The Advisory Mental Health Council of NIMH expressed particular concern about the dearth of young scientists committing themselves to research in adolescent and children's mental disorders. It recommended a phased increase in NIMH support for research[83] and research training in adolescent and children's mental disorders from a total of $92.3 million in fiscal year 1990 to $283.3 million by fiscal year 1995 (213).[84]

The Federal Government has become involved somewhat circuitously in financing adolescent mental health services, in funding and promoting research, and in fostering coordinated service delivery. Either the activity's focus has been broader than just mental health, or adolescents have been beneficiaries of programs serving a larger population (e.g., low-income families as in Medicaid, children and adolescents, all mentally ill individuals). Scant regard has been paid to the unique developmental aspects of adolescence which seem to merit a distinction between adolescent mental health and either child or adult mental health. While more than an afterthought, adolescent mental health has not been a high priority on the Federal agenda.

Conclusions and Policy Implications

Although a national systematic epidemiological study has not yet been mounted, and definitional issues persist, recent data suggest that approximately 1 out of 5 U.S. adolescents ages 10 to 18 suffers from a mental health problem severe enough to require treatment. About 1 out of 4 U.S. adolescents reports symptoms of emotional distress.[85] In general, the adolescents most likely to be diagnosed with a mental disorder are male and/or of lower socioeconomic status. Females are more likely than males to report subjective distress.

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[83] The recommended increase was to support both clinical research and services research. *Clinical research* is conducted in a clinical setting, focusing on questions regarding such matters as epidemiology, etiology, or treatment effectiveness. *Services research*, on the other hand, examines systems issues like services needs, effective delivery mechanisms, or financing options.

[84] The budgets for child and adolescent mental health recommended by the Institute of Medicine and by the Advisory Council of NIMH were structured differently and cannot be directly compared. Nonetheless, the funding level recommended by the Advisory Council represents a significant increase over the recommended level of funding endorsed by the Institute of Medicine.

Suicide is perhaps the most severe manifestation of mental health problems among adolescents, and the official suicide death rate has more than doubled for 15- to 19-year-olds since 1968. Trends in adolescent suicide attempts are not available, but in 1987, 1 out of 7 adolescent 10th graders reported having attempted suicide. White, American Indian, and male adolescents are most likely to commit suicide. Female adolescents are more likely than males to report suicide attempts.

While between 18 and 22 percent of all adolescents are estimated to need some mental health treatment, perhaps 6 percent actually receive some level of care from the mental health system in a given year, meaning that at least two-thirds to three-quarters of adolescents who do have—or are likely to have—a diagnosable mental disorder have no contact with a mental health provider. This estimate of the gap between services and need does not take into account the duration, intensity, appropriateness, or quality of the level of service provided; in addition, it does not include the adolescents who may not have a diagnosable disorder but may be in need of services because they are experiencing subjective distress.

In addition to attempting to estimate the gap between mental health service need and availability, this chapter evaluated the effectiveness of two levels of prevention of mental health problems among adolescents: promotion of positive mental health, and prevention of suicide. In addition, it provided an overview of the mental health treatment system, including (to the extent possible) changes over time in adolescents' utilization of mental health treatment services, reasons for the gap between service needs and availability (including shortcomings in financing of mental health treatment services and lack of coordination among systems charged with serving the health and related needs of adolescents), the effectiveness of mental health treatment for adolescents, and innovative approaches to service delivery. Finally, it examined the Federal role in enhancing mental health services for adolescents. The remainder of this chapter draws conclusions about each of these issues, and notes the policy implications for each of them.

The Promotion of Mental Health and Prevention of Mental Health Problems Among Adolescents

Despite a mounting literature on positive mental health promotion, there remains a need for additional, rigorous scientific research on mental health risks, appropriate interventions, and program outcomes (both immediate and longitudinal). Additional research is needed on the social competence model of mental health promotion to assess the effects of various interventions on children with different sociodemographic characteristics, adjustment levels, and learning styles (225). Nonetheless, mental health promotion efforts seem a promising way to help adolescents cope with the changes that adolescence brings and develop the skills needed for the future. Mental health promotion efforts may not involve labeling any adolescent as having a mental disorder, and, if done well, they can give adolescents a chance to develop empathy, improve interpersonal relations, and, perhaps, avoid experiencing untoward distress and serious behavioral problems (92a).

Programs for the prevention of specific mental disorders have not been adequately assessed either, although one observer goes even further in criticizing the state of the art in prevention. Shaffer asserts that there is a consensus among mental health care providers that primary prevention of mental disorders is not possible in most instances, precisely because our knowledge of causes and mechanisms of adolescent mental disorders is so limited (169). He argues for more epidemiological and longitudinal research to correct the deficit, as well as for increased attention to early intervention (secondary prevention) for those adolescents exhibiting early symptoms of mental health problems.

The effectiveness of suicide prevention efforts is difficult to evaluate, in large part because the base rate of completed suicides is low. Thus, the effectiveness of suicide prevention efforts is often assessed in terms of gains in knowledge and changes in attitude. Shaffer's comments about the difficulty of primary prevention seem particularly applicable to suicide, although there may be one exception. Given that firearms are the leading method for committing suicide (accounting for half of all successful adolescent suicides), limiting adolescents' access to firearms would probably reduce the number of completed suicides, if not the number of suicide attempts.

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[85] It is unclear to what extent the proportion of adolescents who report symptoms of distress overlaps with the proportion who are found to have mental disorders using standard diagnostic criteria.

The Delivery of Mental Health Treatment Services to Adolescents

In considering policy changes directed toward the mental health treatment system, it is important to review both recent encouraging developments and persistent problems in the mental health treatment system.

A number of gains in the mental health service system for adolescents in recent years provide a foundation for future policy changes:

- A child and adolescent mental health presence has been established in almost every State as a result of CASSP (the Child and Adolescent Service System Program) of NIMH. This presence has increased awareness of child and adolescent mental health needs among legislators, service planners, and providers and identified promising approaches to address those needs.
- Models for the provision of comprehensive, coordinated mental health services to adolescents have been developed in selected parts of the country (e.g., the Ventura County Project in California; the Kaleidoscope Program in Chicago; and the Alaska Youth Initiative), demonstrating that community-based, multisystem, public sector efforts are feasible and apparently promising in terms of effectiveness.
- There is a growing, though still incomplete, research base on the potential effectiveness of a range of mental health services for adolescents.
- There was an across-the-board increase between 1975 and 1986 in the use of mental health services in organized settings by adolescents. Increases were greatest in the use of outpatient mental health services such as psychotherapy and partial hospitalization. National data are not available to track growth in use of other nonresidential services, like home-based services and therapeutic foster care.

Perplexing and persistent problems in mental health service delivery include the following:

- Adolescents who need mental health and related (e.g., social, educational, general health) services from multiple agencies continue to suffer in most communities as they are bounced from one bureaucracy to another, often preceded by a wait to meet eligibility requirements for services. Interjurisdictional rivalries often prevent the pooling of resources to enrich the availability of community-based services and deter development of a comprehensive and effective mental health system. The State Comprehensive Mental Health Services Plan (Public Law 99-660, as amended) may help alleviate this problem. That law may provide an opportunity to identify local resources and coordinate the array of services used by adolescents with mental health problems and their families (e.g., intake and assessment, treatment, rehabilitation, crisis intervention, education, housing, recreation).
- Even when mental health treatment services are available for adolescents, some adolescents' access to those services may be limited because of their inability to pay for the services. The lack of health insurance, health insurers' limitations on mental health benefits, and restrictive Medicaid policies in some States are all factors that may limit utilization of mental health services by adolescents in need.
- In 1986, racial and ethnic minority adolescents received disproportionately fewer inpatient and outpatient services *in specialty mental health organizations* than did white, non-Hispanic adolescents. Further, racial and ethnic minority adolescents received fewer services from such facilities in 1986 than they did in 1975 (relative to the size of their populations). It is unclear why this change occurred, but it may be related to inadequate Medicaid funding, and the increase in reliance on commercial health insur-

ance, for such services.[86] Lack of "cultural competency" in the service delivery system has also been implicated.

- There are apparent shortages of mental health professionals with expertise in treating adolescents, and such shortages may contribute to the limited availability of mental health services for the adolescent population.

The combination of encouraging developments and persistent problems in the mental health treatment system just cited has a number of implications for change. To begin to correct the problems of mental health service delivery will require attention at Federal, State, and local levels, across systems of care which serve adolescents, and by the professional organizations of physical and mental health providers concerned with the adolescent population. Major implications for change in mental health services can be grouped in five areas and are discussed in more detail below:

1. developing local systems for the delivery of mental health services,
2. financing the delivery of mental health treatment services,
3. use of institutional mental health care,
4. training for mental health professionals, and
5. research on services for adolescents with mental health problems.

Developing Local Systems for the Delivery of Mental Health Services

If adolescents are to have mental health treatment services available to them in proportion to their need, the capacity of local communities to deliver such services will have to be expanded. Furthermore, achieving a rational and integrated system of comprehensive care for adolescents will require a reconfiguration of the mental health service delivery system. Critical areas for change in the mental health service delivery system were specified recently by Knitzer and Yelton:

> 1) strengthening, systematically, the range of nonresidential services that are available to children and adolescents and families across systems, 2) anchoring responsibility for individual children (and adolescents) through a cross-agency case-management system, and 3) creating a new organizational framework to facilitate cross-system decisionmaking and resource sharing (117).

Such changes will require new resources. Federal and other grants to build mental health system capacity at the local level should encourage the development of a continuum of care for mental health and related problems in those agencies which are most likely to serve adolescents. Funding should be flexible so that implementation of individualized service plans for adolescents with mental health problems is feasible.

Priority should be given to increasing the availability of the least restrictive forms of treatment that are appropriate (e.g., home-based crisis services, day treatment, and therapeutic foster care). Research on the appropriateness of various levels of care is essential, so that decisions are not based solely on insurance status or the physical availability of mental health services.

Financing the Delivery of Mental Health Services

If State and local governments are to respond to the need for developmentally appropriate mental health services for adolescents, funding sources must allow greater flexibility in the use of funds. Fragmented and restrictive financing mechanisms impede the delivery of comprehensive and coordinated mental health and related services. But if resources could be pooled and redirected to meet individual treatment needs of adolescents with mental health problems, funding streams could provide incentives for interagency linkages and a more cohesive mental health "system" might begin to emerge. Programs also could more readily be held accountable for client outcomes, since they would be better positioned to garner the resources necessary to do the job they were intended to do.

The challenge for Federal and other policymakers is to forge funding approaches that respond to individual treatment needs, rather than continuing to finance services tied to specific delivery sites (e.g., hospitals, residential treatment centers, day treatment programs, community mental health centers). When the individual is the focal point of service financing, jurisdictional barriers can be crossed and interagency coordination and cooperation becomes a necessity.

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[86] As discussed in ch. 18, "Issues in the Delivery of Services to Selected Groups of Adolescents," in Vol. III, half of black, Hispanic, and American Indian and Alaska Native adolescents live in poor or near-poor families and are likely to depend on Medicaid to gain access to health services. Further, not all poor or near-poor adolescents are eligible for Medicaid, and Medicaid coverage of mental health services is even more restricted than that for services related to "physical" illnesses and conditions (see above and ch. 16, "Financial Access to Health Services," in Vol. III).

Examples of some models of mental health service delivery that allow flexible funding already exist. These examples illustrate that the seemingly daunting task of relaxing fiscal constraints on programs can be overcome. In the Alaska Youth Initiative, for example, funds previously used for residential treatment center placements were redirected toward development of community programs for the same adolescents. Some private insurance companies are beginning to experiment with individualized mental health treatment plans that are not restricted by the usual outpatient benefit limits. These plans permit reimbursement for community-based alternatives when it becomes clear (on a case-by-case basis) that institutional care would be more expensive.[87] Similarly, Medicaid allows States to apply for a waiver to use funds for innovative community services. Only Vermont has taken advantage of this option however, and its impact has not been evaluated.[88]

In the long term, Federal and other policymakers should probably develop more durable and well-delineated policies to finance mental health services in communities. In the public sector, these policies might involve: 1) sharing resources across agencies (e.g., social services departments could reimburse the mental health system for in-State or community care); 2) use of State Medicaid matching funds to promote coordination across agencies; 3) more creative and extensive use of the Medicaid Home and Community Care option, which could substantially increase reimbursement for community-based services; and 4) creative use of EPSDT Federal regulations to correct the significant inequities in coverage of mental health services by Medicaid across States. Insurance companies may have to be convinced with cost-effectiveness studies that the range of community interventions being advocated is both viable and effective.

Use of Institutional Mental Health Care

The third major policy area, concern about extensive use of private psychiatric hospitals and residential care for adolescents, requires careful attention, although the Federal role in this area has been limited. NMHA has proposed a number of recommendations directed at reducing excessive use of mental hospitals and residential treatment centers for children (see box 11-D).

Hospitals and residential treatment centers provide an important component of care for severely mentally disturbed adolescents, albeit on the extreme end of the continuum. Explicit criteria for the most restrictive and expensive forms of treatment need to be developed. The Federal Government could support efforts to develop such criteria.

Resolving the issue of appropriate use of general hospitals, psychiatric hospitals, and residential treatment centers vs. less restrictive levels of care for adolescents with mental health problems is likely to require major public/private sector negotiation. Private psychiatric hospitals—major providers of inpatient adolescent care—tend not to serve public Medicaid patients. These hospitals are more likely to offer comprehensive care than general hospitals, however, and, in some communities, they have more extensive resources than the public mental health agencies. An area to explore is whether some of these well-established hospitals could be interested in providing comprehensive care for a broader socioeconomic range of adolescent patients (as is currently occurring at Sheppard Pratt Hospital in Baltimore through a contract with the State of Maryland) (39). Residential treatment centers, mostly private, nonprofit organizations, are reimbursed largely under governmental contracts with public dollars. Possibly residential treatment centers could offer a broader range of mental health services to local populations in the areas where they are located.

Training for Mental Health Professionals

Although comprehensive data on the numbers of mental health professionals trained to work with adolescents are not available, the difficulties encountered in filling clinical positions (39) and with the data that are available make it clear that there are shortages. If adolescents are to receive mental health

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[87] See ch. 16, "Financial Access to Health Services," in Vol. III.

[88] See ch. 16, "Financial Access to Health Services," in Vol. III.

Box 11-D—The National Mental Health Association's Recommendations To Limit Use of Inpatient Mental Health Care

1. Create community-based mental health services.
2. Develop a child-centered and family-focused system of mental health services.
3. Adopt a children's Bill of Rights (to protect against inappropriate placements).
4. Plan to return children home (applies to children placed out of State).
5. Prohibit placements outside of the State's jurisdiction.
6. Prohibit treatment of children in adult wards of State hospitals.
7. Establish a gatekeeping system (i.e., local case review committees to prevent out-of-home placement unless there is no alternative).
8. Fully implement Public Law 94-142 (Education for All Handicapped Children Act).
9. Improve State monitoring.
10. Provide case management from the child's perspective.
11. Expand advocacy.
12. Mandate interagency planning.
13. Permit flexible use of funds.
14. Improve or repeal interstate compacts.
15. Improve data collection (refers to improving data systems on services for children with emotional problems).
16. Conduct a national study to determine the status of children in private psychiatric facilities.

SOURCE: National Mental Health Association, *Report of the Invisible Children Project* (Washington, DC: 1989).

services, a sufficient number of mental health professionals must be recruited into the child and adolescent mental health field and encouraged to locate throughout the Nation. NIMH funding for clinical training has diminished over the years. One possibility is for States to assume a more significant role in training clinicians to work with adolescents and their families. Another possibility is for NIMH to increase its funding for clinical training (127a). Continuing education to promote clinicians' awareness of innovations and successful models of service delivery would also be useful.

Finally, as new policies for mental health services are deliberated, sensitivity to the needs of different cultural, ethnic, and racial groups needs to be a priority. Designing services that are more responsive to minorities may be a community-level issue, but the recruitment and training of minority clinicians and the development of appropriate knowledge bases pertaining to adolescents, have implications at the State and national level. A recent volume describing the consensus about provision of mental health services to minority children and adolescents with mental illness delineates a number of useful guiding principles (53,204), but as discussed more fully in chapter 18, "Issues in the Delivery of Services to Selected Groups of Adolescents," in Vol. III of this Report, much more research needs to be done on this topic.

Research on Services for Adolescents With Mental Health Problems

Research on services for adolescents with mental health problems has lagged behind research on such services for adults. Ideally, service systems for mental health problems should be designed on the basis of clear conceptions about disorders (including definition, etiology, course, and prognosis) and knowledge about the efficacy of treatment for specific disorders and populations. But controversy surrounds both the diagnosis of adolescent mental health problems and their treatment. Thus, there are research deficits in epidemiological data, clinical information, and services data.

Although the existing knowledge base offers some general guidance to mental health providers and policymakers, more precise guidance on the types of treatment to be offered cannot be offered without significant research advances. The unavoidable need for service systems development requires that research on service systems proceed at the same time that the epidemiological and clinical research base continues to mature. Findings will have to be incorporated into policy developments and into research on service systems on an incremental basis.

The following implications for research touch briefly on epidemiological and clinical research that is directly relevant to mental health service systems development. A more comprehensive research agenda addressing these areas can be found in the 1989 Institute of Medicine and the NIMH Advisory Mental Health Council reports on research pertaining to children and adolescents with mental, behavioral, and developmental disorders (139,213). Both reports recommended significant increases in Federal support for research on mental health services and systems of care for children and adolescents, and even larger amounts for other types of research on the mental health problems of children and adolescents (139).

Research is needed to accomplish the following tasks:

1. *Develop estimates of adolescents' need for mental health services based on epidemiological surveys.* At all levels of care, the utilization of mental health services by adolescents is increasing. Despite increases in service use, the low rate of mental health service use relative to need represents a significant concern. While an estimated 20 percent of U.S. adolescents need mental health services, only about 6 percent of adolescents use such services. The possibility that a number of adolescents are receiving mental health care through sectors other than the mental health system (i.e., health, education, social services, and juvenile justice) needs to be examined in studies at the national, State, and local levels to more accurately assess the availability of mental health services. The low rates of mental health service use by adolescents also suggest a need to study the perceived accessibility of services to adolescents from the perspectives of cost and comfort with seeking care.

Estimating adolescents' need for mental health care will require going beyond the usual approach of identifying the gap between adolescents with a mental health condition and those actually receiving services. The need for treatment must be related to specific system components and defined in terms of severity of illness, level of functioning, family concerns, community attitudes, and capacity. For that reason, the inclusion of such parameters in the forthcoming child and adolescent epidemiology catchment area studies will be important.

2. *Evaluate the effectiveness of various mental health treatment modalities for adolescents.* Given the very limited and poorly controlled research literature on the effectiveness of mental health treatment modalities for adolescents, research is needed on all levels of care and all types of services.

An initial priority for a research agenda should be to carefully delineate the characteristics of adolescents who require and benefit from inpatient and residential settings. Research on the more restrictive and expensive forms of treatment needs to be balanced with research on innovative and less expensive forms of care. Future studies on the effectiveness of psychotherapy, psychotropic medication, and other outpatient services should give special attention to low-income and minority populations and should pay attention to specific clinical conditions and comorbidities (particularly substance abuse and other mental disorders). A major initiative could be designed to assess the effectiveness of different treatment modalities for adolescents with conduct disorders, as this is a frequently identified clinical population across levels of care and in school-supported programs for emotionally disturbed children and adolescents (71). Research on psychotropic medications requires larger adolescent samples and longer followup periods than are typically used. In addition, the appropriate modes of treatment for subclinical problems that are disturbing to adolescents, but that may not meet the criteria for diagnosable disorder, deserve attention.

In planning studies of the effectiveness of mental health treatment for adolescents, it is important to give methodological issues critical attention. Research on treatment modalities should be of experimental or quasi-experimental designs. Studies with random assignment of subjects are preferable, but if randomized studies are not feasible, researchers should find acceptable comparison groups. To be useful in assessing treatment effectiveness, studies should be longitudinal, assess combinations of treatments, and pay special attention to reliable and valid outcome measures. With sound information about effectiveness, the next level of studies can be considered.

3. *Assess the potential for substitution of community-based mental health treatment services for restrictive institutional services.* This undertaking seems warranted because of observations that institutional care may be overutilized for adolescents with mental health problems and that the great majority of service dollars are tied up in hospitals and residential treatment settings. Some of these restrictive institutional services may neither be required nor effective (at least for selected clinical groups), but these issues ought to be very carefully examined. Alternative service strategies should be in place before research to test substitution of services is undertaken.

4. *Develop criteria for quality mental health treatment of adolescents.* An initial step may be to obtain descriptive data on the characteristics of clients and clinical practices at each level of mental

health care. This would provide a basis for consensus groups to propose criteria or standards for care that would define quality. A subsequent critical step would be to explore and identify linkages between clinical processes and client outcomes to be sure that quality care does in fact result in positive outcomes.

5. *Determine effective mental health service system design and development.* Comprehensive service models using a continuum of care have been reviewed (e.g., the Ventura County Project California, the Alaska Youth Initiative), and additional research is underway. Further research opportunities to compare approaches to organizing services will emerge as the child and adolescent demonstrations recently funded by the Robert Wood Johnson Foundation get underway. In order to be most useful, organizational models need to be clearly described, fully tested, and replicated for their differential ability to affect rates of service use by target populations, quality of care, cost, and clinical outcomes.

To determine whether increased availability and provision of mental health services actually results from capacity-building policy changes, the relationship between policy change and service system capacity needs to be critically examined (186a). There is also a need to evaluate service system performance to assess whether clients who are the most in need receive services in ways that meet their needs. The usefulness of case management as a systems level intervention also requires specific attention. Case managers, particularly for seriously emotionally disturbed youth, are being employed across the country, but OTA is not aware of any published research on their effectiveness with adolescent clients.

Finally, research on the extent, adequacy, and appropriateness of mental health services for adolescents provided in sectors other than the mental health system—primary health care, juvenile justice, social welfare, and the schools—should be expanded in order to develop a complete picture of adolescents' access to appropriate and effective mental health services. Currently, the lack of complete information may lead to diffusion of responsibility—a sense that the adolescent "must be" receiving care in some other system. Areas for investigation range from the adequacy of diagnosis and the appropriateness of treatment provided in these sectors to the mechanisms available for coordinating care with the traditional mental health system.

6. *Evaluate alternative methods for financing mental health services for adolescents.* In order to improve access for adolescents, techniques ranging from varying insurance benefits to creating fiscal incentives for improving community care, should be explored to identify financing methods that facilitate implementation and operation of a continuum of care. Further, financing mechanisms that influence utilization of mental health services (such as managed care with a network of contracted providers v. a fee-for-service system) need further attention to determine their impact on adolescent client groups.

7. *Strengthen recruitment and training of researchers in adolescent mental health.* In order to eventually improve the system of care for adolescents, NIMH should continue to be encouraged to support the recruitment and training of mental health professionals prepared to conduct research on adolescent disorders, treatment, and services. This need was reflected as a priority in the 1989 Institute of Medicine report on research (139).

Summary of Federal Policy Implications

Although mental health policy and program changes can be made in both the private and public sectors, and at many levels of both sectors, the Federal Government could take several steps to improve adolescent mental health.

In order to make mental health services available for more adolescents, the Federal Government could support efforts to make health insurance more available for mental health problems. One way to do this would be to mandate changes in Medicaid rules pertaining to mental health services. In order to be consistent with the goal of providing care in the least restrictive environment, any such changes could favor outpatient and other nonresidential forms of care over inpatient care.

To the extent that insurance reimbursement depends on the existence of a diagnosable mental disorder, adolescents' subjective distress may be overlooked. In addition, the approachability of mental health services for adolescents may be reduced by insurance requirements for parental consent or notification.[89] In order to increase access to mental health services for adolescents—based on their subjectively perceived needs—the Federal Government could support the increased availability of mental health services for adolescents in accessible settings such as schools.[90]

One factor that impedes efforts to increase availability of mental health services to adolescents is the paucity of mental health professionals specially trained to deal with adolescents. The Federal Government could support a major clinical training effort to increase the number of mental health professionals trained to work with adolescents.

A second factor holding back a major effort to increase mental health services for adolescents is the paucity of research on the full range of issues related to adolescent mental health, including epidemiology, risk and protective factors, prevention, treatment, and service systems. As recommended by the Institute of Medicine and the NIMH's National Advisory Mental Health Council, Federal funds for mental health research and research training need to be increased dramatically for the foreseeable future (139,213). Because the appropriateness and effectiveness of inpatient and residential treatment for adolescents is so controversial an issue, objective, scientific research on the topic requires particular attention.

Much of the Federal Government's attention to mental health issues—for all ages combined—pertains to serious mental disorders. This focus may not be appropriate for adolescents, many of whom may require help in learning how to deal with normal life circumstances (e.g., 92a) and/or suffer from subjective distress. In order to be responsive to the needs of adolescents as a group, the Federal Government could initiate efforts to support: 1) the promotion of positive mental health (for all adolescents); and 2) early treatment intervention for those adolescents at high risk for problems, as evidenced by their subjective distress, their troubled behavior [which may not meet the criteria of DSM-III-R], or their life circumstances. Research efforts are needed to substantiate the most effective ways of meeting these adolescent needs, although more progress has been made in the area of mental health promotion. In sum, a much more active effort is needed on the part of the Federal Government if adolescents' mental health needs are to be met.

Specific options for congressional consideration are listed in Vol. I of this Report, *Summary and Policy Options*.

Chapter 11 References

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[89] This issue is discussed more fully in ch. 16, "Financial Access to Health Services," and ch. 17, "Consent and Confidentiality in Adolescent Health Care Decisionmaking," both in Vol. III.

[90] For a discussion of school-linked health services, see ch. 15, "Major Issues in the Delivery of Primary and Comprehensive Health Services to Adolescents," in Vol. III.

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Chapter 12

ALCOHOL, TOBACCO, AND DRUG ABUSE: PREVENTION AND SERVICES

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Chapter 12

ALCOHOL, TOBACCO, AND DRUG ABUSE: PREVENTION AND SERVICES

Introduction

The use and abuse of alcohol, tobacco, and illicit drugs are currently of great concern to the American public (106,310,312). The abuse of alcohol and other psychoactive (mind-altering) substances is often seen as particularly dangerous for adolescents because it can interfere with the "developmental tasks" of adolescence.[1] [2]

Box 12-A provides a general overview of alcohol and other major classes of psychoactive substances with the potential for abuse and/or dependence. The effects of psychoactive substances vary, depending on the specific substance used, on the quantity, frequency, and duration of use, on users' expectations, on the mode of administration, and on whether other substances are used simultaneously (147,156). It is beyond the scope of this chapter to delineate all of the possible effects of psychoactive substances. As discussed later, very little is known about the specific effects of psychoactive substances on adolescents.

This chapter discusses definitions of substance abuse and reviews available evidence on the use of alcohol, tobacco, and other psychoactive substances among U.S. adolescents. The chapter then examines family, peer related, personal, and other risk factors associated with the initiation and continuation of psychoactive substance use; the consequences of psychoactive substance use and abuse for adolescents; and the economic costs to society. It next considers the effectiveness of preventive and treatment interventions. The chapter concludes with a consideration of issues pertaining to relevant Federal programs and policies.

Background on Psychoactive Substance Use and Abuse

Definitions of Substance Abuse

There is considerable controversy about what constitutes substance abuse among adolescents (see box 12-B). Some would maintain that *any* use of alcohol and other drugs by an adolescent should be considered substance *abuse*. Others suggest that *experimentation*—particularly with such psychoactive substances as alcohol or tobacco that are available for purchase by adults of legal age—is part of normal late adolescent development and does not necessarily have harmful consequences (26,208,252, 263).[3] The Alcohol, Drug Abuse, and Mental Health Administration (ADAMHA) within the U.S. Department of Health and Human Services (DHHS) has expressed the view—through its Office for Substance Abuse Prevention (OSAP)—that *any* drug use by adolescents should be prevented (311). Another ADAMHA agency, the National Institute on Drug Abuse (NIDA), has defined drug abuse in other ways (302,303). The American Psychiatric Association, using clinical criteria specified in the *Diagnostic and Statistical Manual of Mental Disorders*, 3rd ed., revised (DSM-III-R), draws distinctions between psychoactive substance use, abuse, and dependence, with dependence being more serious than abuse (see box 12-B). The criteria in DSM-III-R make no distinctions between adults and adolescents (4).

In the discussion that follows, except where otherwise noted, the term "*psychoactive substance use*" includes the entire range of experience with a psychoactive substance—from a single exposure to prolonged and habitual use. The term "*psychoactive substance abuse*" is used whenever a more limited meaning (i.e., use that results in injury, incapacity,

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[1] This chapter uses the general term psychoactive substance to cover alcohol, nicotine (found in tobacco), and illicit drugs (e.g., heroin, cocaine, marijuana). Strictly speaking, all of these substances are drugs (i.e., chemical or biological substances that can be used to affect the structure or function of the body). However, the term drug is sometimes used to refer specifically to illicit drugs.

[2] For a discussion of some of the developmental tasks faced by adolescents, see ch. 2, "What Is Adolescent Health?" in this volume.

[3] However, it should be noted that most researchers now believe that the use of psychoactive substances in childhood or in the first years of adolescence is *not* normal and may be predictive of serious behavioral problems in later adolescence (263).

Box 12-A—Overview of Alcohol and Some Other Psychoactive Substances

Class of psychoactive substance[a]	Description[b]	Examples
ALCOHOL (ethyl alcohol)	Alcohol, one of the most widely used of all drugs, is a central nervous system depressant with effects similar to those of sedative-hypnotic compounds (see below). At low doses, alcohol may be associated with behavioral excitation thought to be due to the depression of inhibitory neurons in the brain. Alcohol differs from sedative-hypnotic compounds in that is used primarily for recreational or social rather than medical purposes.	1. Beer 2. Wine 3. "Hard" liquor (e.g., whiskey, gin).
SEDATIVES, HYPNOTICS, OR ANXIOLYTICS	Sedative-hypnotics are drugs of diverse chemical structure that exert a nonselective general depressant action on the central nervous system. In addition, they reduce metabolism in a variety of tissues in the body, depressing any system that uses energy. Depending on the dose, any sedative-hypnotic compound may be classified as a sedative (an agent that allays excitement), a tranquilizer (an antianxiety agent), a hypnotic (a sleep-inducing agent), or an anesthetic (an agent that eliminates pain). Sedative-hypnotics are used medically as sedatives, anxiolytics (antianxiety agents), hypnotics, antiepileptics, muscle relaxants, and general anesthetics.	1. Barbiturates ("downers" or "barbs"): pentobarbital sodium [Nembutal^{R}], secobarbital sodium[Seconal^{R}], amobarbital [Amytal^{R}]—taken orally 2. Nonbarbiturate hypnotics: methaqualone [Quaaludes^{R}])—taken orally 3. Tranquilizers: diazepam [Valium^{R}], chlordiazepoxide hydrochloride [Librium^{R}]—taken orally
CANNABIS (THC)	THC (tetrahydrocannabinol), the active agent in marijuana, alters perceptions, concentration, emotions, and behavior, though the mechanisms of action are not entirely clear. Researchers have found, however, that THC changes the way in which sensory information is processed by the brain. It can be used medically to relieve nausea and side effects of chemotherapy in cancer patients; it is very rarely used to treat glaucoma.	1. Marijuana ("pot" or "grass")—smoked or eaten 2. Hashish ("hash")—smoked or eaten 3. Hashish oil ("hash oil")—smoked (mixed with tobacco) 4. Tetrahydrocannabinol (THC)—taken orally in capsules
NICOTINE (active ingredient in tobacco)	Nicotine, obtained naturally from tobacco, is a central nervous system stimulant.[c] It exerts its action secondary to stimulation of certain cholinergic (excitatory) synapses both within the brain and in the peripheral nervous system.	1. Cigarettes 2. Smokeless tobacco (i.e., snuff or chewing tobacco)

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[a] According to Julien, one could conceivably classify psychoactive drugs by at least three methods: 1) mechanism of action, 2) chemical structure, and 3) behavioral effects. Probably the most useful approach would be to classify them by mechanism of action, but knowledge of the brain's physiology is too limited for this approach to be comprehensive. A limitation of the second approach is that many drugs of apparently similar structure exert quite different effects, and many drugs of dissimilar structure exert quite similar effects. The classification in this table largely reflects the behavioral effects approach. The classification used here is based on the categories in the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders*, 3rd ed., revised. Acuording to the American Psychiatric Association, all of the classes of psychoactive substances listed in this box except nicotine are associated with both abuse and dependence. Nicotine is associated with dependence but not abuse.

[b] The potential physiological, psychological, and behavioral effects of using the psychoactive substances shown are discussed in the sources listed below. The consequences depend in part on the specific drug used, the dosage level and mode of administration.

[c] *Central nervous system stimulants* are drugs that can elevate mood, increase alertness, reduce fatigue, provide a sense of increased energy, decrease appetite, and improve task performance. They can also produce anxiety, insomnia, and irritability. The drugs differ widely in their molecular structures and mechanisms of action.

COCAINE	Cocaine, obtained naturally from coca leaves, is a potent central nervous system stimulant.[c] It stimulates the sympathetic nervous system, which regulates the activity of cardiac muscle, smooth muscle, and glands. It also produces bronchodilation in the lungs. It is used medically as a topical anesthetic for surgical procedures.	1. Cocaine hydrochloride powder ("coke" or "street cocaine")—usually snorted or injected intravenously[d] 2. Cocaine alkaloid ("freebase" or "crack")—smoked[e]
AMPHETAMINES AND RELATED STIMULANTS[f]		
1. Amphetamines	Amphetamines are a group of three closely related compounds, all of which are potent central nervous system and behavioral stimulants.[c] Some amphetamines are used medically to treat attention deficit disorder or minimal brain dysfunction in children, narcolepsy (recurrent, uncontrollable, brief episodes of sleep), or (rarely) depression.	1. Amphetamine ("speed" or "uppers") [Benzedrine^{R}]—taken orally, injected, or snorted[g] 2. Methamphetamine ("speed" or "crystal meth" or "ice") [Methadrine^{R}]—taken orally, injected, or snorted[g] [h] 3. Dextroamphetamine [Dexedrine^{R}]—taken orally, or injected
2. Nonamphetamine stimulants	Like amphetamines, nonamphetamine stimulants are central nervous system and behavioral stimulants. Some nonamphetamine stimulants (e.g., Preludin^{R}) are used for weight control, and some (e.g., Ritalin^{R} and Cylert^{R}) are used medically to treat hyperactivity, minimal brain dysfunction, narcolepsy, or (rarely) depression.	1. Pheumetrazine hydrochloride [Preludin^{R}]—taken orally or injected[d] 2. Methylphenidate hydrochloride [Ritalin^{R}]—taken orally or injected[d] 3. Pemoline [Cylert^{R}]—taken orally
HALLUCINOGENS	Hallucinogens, or psychedelics, are a heterogeneous group of compounds that affect a person's perceptions, sensations, thinking, self-awareness, and emotions.[i]	1. LSD (lysergic acid diethylamide) or "acid"—taken orally, put in the eyes 2. Mescaline (3,4,5-trimethyloxphenylethylamide) or "mesc," and peyote—disks chewed, swallowed or smoked; tablets taken orally 3. Psilocybin ("magic mushrooms")—chewed and swallowed 4. MDMA (methylene dioxymethamphetamine)—taken orally

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[d] According the American Psychiatric Association, the route of administration of a psychoactive substance is an important variable in determining whether use will lead to dependence or abuse. In general, routes of administration that produce more efficient absorption of the substance in the blood stream (e.g., intravenous injection) tend to increase the likelihood of an escalating pattern of substance uses that leads to dependence. Routes that quickly deliver psychoactive substances to the brain (e.g., smoking or intravenous injection) are associated with higher levels of consumption and with an increased likelihood of toxic effects. Use of contaminated needles for intravenous administration of amphetamines, cocaine, and opiates can cause hepatitis, HIV infection, and other illnesses.

[e] *Freebase cocaine* is a form of cocaine made by converting "street cocaine" (cocaine hydrochloride) to a purified base that is smoked. The effect of smoking freebase is similar to that of intravenous injection but smoking provides a shorter more intense high than sniffing or ingestion because of the rapid absorption of the drug through the lungs. "*Crack cocaine*" is the street name given to freebase cocaine that has been processed from cocaine hydrochloride to a chemical base by cooking it with baking soda and water. The term crack refers to the cracking sound that is heard when the mixture is smoked (heated), presumably due to the sodium bicarbonate.

[f] Describing a drug as a stimulant does not adequately describe its properties. Drug use surveys typically mean amphetamines when they use the word stimulants. Some surveys regard as stimulants both prescription (amphetamines) and nonprescription substances (e.g., caffeine-based compounds used in No-Doz, diet pills, and "fake pep pills"). Cocaine and nicotine (described above) are also central nervous system stimulants.

[g] According to the National Institute on Drug Abuse, *designer drugs* are structural analogs of substances scheduled under the Controlled Substances Act that are prepared by underground chemists to mimic the psychoactive effects of controlled substances or produce other psychoactive effects. Because such analogs are not identical to their parent compound, their manufacture and distribution does not violate the law. As of June 1986, there were synthetic analogs of PCP, fentanyl and meperidine, and amphetamine and methamphetamine.

[h] In the past, abuse of methamphetamine had been in the form of tablets or intravenous injection. More recently, "ice" (one of the more common street names for *d*-methamphetamine hydrochloride) has gained popularity in a form suitable for smoking.

[i] Most the agents included in this class of drugs can induce hallucinations if the dose is high enough. But the term hallucinogen does not adequately describe the range of pharmacological actions of the diverse group of substances usually included in the class. The term psychedelic was proposed by Osmond in 1957 to imply that these agents all have the ability to alter sensory perception and thus may be considered "mind expanding." The effects of hallucinogens are unpredictable and depend on the amount taken, the user's personality, mood and expectations, and the surroundings in which the drug is used.

Continued on next page

Box 12-A—Overview of Alcohol and Some Other Psychoactive Substances—Continued

Class of psychoactive substance[a]	Description[b]	Examples
INHALANTS	Inhalants are chemicals that produce psychoactive vapors. Although different in makeup, nearly all of the abused inhalants produce effects similar to those of anesthetics, which act to slow down the body's functions or produce feelings of dizziness. At low doses, users may feel slightly stimulated. Amyl nitrite is used for heart patients because it dilates the blood vessels and increases blood supply to the heart. There are no medical indications for most of the inhalants.	1. Solvents (model airplane glue, nail polish remover, lighter and cleaning fluids, and gasoline)—vapors inhaled 2. Aerosols (e.g., paints, hairsprays)—vapors inhaled 3. Some anesthetics (e.g., nitrous oxide)—vapors inhaled 4. Amyl nitrite ("snappers" or "poppers") and butyl nitrite ("rush")—vapors inhaled
OPIATES (NARCOTICS) AND RELATED ANALGESICS	Opiates are natural or synthetic drugs that, like morphine, a substance derived from the opium poppy, have analgesic (pain-relieving) properties. Heroin is not approved for medical uses in the United States. The major medical use of other opiates is for the relief of pain (i.e., as analgesics); some narcotics are used to relieve coughing (i.e., as antitussives) or to treat diarrhea. Methadone is used in the treatment of narcotic abstinence syndromes and as an analgesic in terminal illness.	1. Heroin ("smack" or "horse")—injected, smoked, or inhaled[d] 2. Codeine (codeine sulfate)—taken orally or injected[d] 3. Morphine (morphine hydrochloride)—injected, smoked, or inhaled. 4. Synthetic opiates (e.g., methadone [Dolophine®]); hydromorphone hydrochloride [Dilaudid®], meperidine hydrochloride [Demerol®], oxycodone and aspirin [Percodan®])—taken orally or injected
PCP (PHENCYCLIDINE) AND SIMILARLY ACTING SYMPHATHOMIMETICS	Phencycyclidine, commonly referred to as PCP, alters the functions of the neocortex and has been called a dissociative anesthetic. It was developed in the 1950s as an anesthetic but was subsequently taken off the market in 1967 when it was discovered that the drug caused hallucinations in some people.[j] PCP is now used legally only in veterinary medicine as an immobilizing agent.	PCP ("angel dust" or "lovely")—taken orally, or smoked (sprayed on joints or cigarettes)[d]

[j] PCP is considered a hallucinogen in some surveys of drug use.

SOURCES: Office of Technology Assessment, 1991, based on the following sources: American Psychiatric Association, *Diagnostic and Statistical Manual of Mental Disorders*, 3rd ed. revised (Washington, DC: 1987); R.M. Julien, *A Primer of Drug Action*, 5th ed. (New York, NY: W.H. Freeman and Co., 1988); J.F. Kauffman, H. Shaffer, and M. Burglass, "The Biological Basics: Drugs and Their Effects," *Alcoholism and Substance Abuse: Clinical Interventions* (New York, NY: 1985); U.S. Department of Health and Human Services, Public Health Service, Alcohol, Drug Abuse, and Mental Health Administration, National Institute on Drug Abuse, "Hallucinogens and PCP, Inhalants, Marijuana, Opiates, Sedative-Hypnotics, Stimulants, and Cocaine," Rockville, MD, 1983; U.S. Department of Health and Human Services, Public Health Service, Alcohol, Drug Abuse, and Mental Health Administration, National Institute on Drug Abuse, "Designer Drugs," *NIDA Capsules*, Rockville, MD, June 1986; U.S. Department of Health and Human Services, Public Health Service, Alcohol, Drug Abuse, and Mental Health Administration, National Institute on Drug Abuse, "Marijuana Update," *NIDA Capsules*, Rockville, MD, May 1989; U.S. Department of Health and Human Services, Public Health Service, Alcohol, Drug Abuse, and Mental Health Administration, National Institute on Drug Abuse, "Methamphetamine Abuse," *NIDA Capsules*, Rockville, MD, January 1989; and U.S. Department of Education, *Growing Up Drug Free: A Parent's Guide to Prevention* (Washington, DC: 1989).

dysfunctionality, destruction, or danger to self or others) is intended.

Some substances associated with abuse or dependence—notably beverage alcohol and tobacco—are legally available in this country, but only to individuals over a certain age. The minimum age for the legal sale/purchase of beverage alcohol in all States and the District of Columbia is 21 (290). The legal minimum age for the legal sale/purchase of cigarettes (which contain nicotine) varies by State (315). As of June 1990, 17-year-olds could buy cigarettes in four States (315). Inhalants such as airplane glue, paint thinner, typing correction fluid, and gasoline are generally legally available for purchase to individuals of all ages,[4] but not for the purpose of inducing intoxication (183). In the United States, a number of substances associated with abuse or

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[4] Some States and municipalities have enacted restrictions on the provision of these substances to minors below statutorily defined ages (159).

Box 12-B—What Constitutes Substance Abuse by Adolescents?

For the purpose of this chapter, the term drug or psychoactive substance use, unless otherwise noted, means drug use (including alcohol or tobacco use) that results in injury, incapacity, dysfunctionality, or destruction or damage to self and others. It is important to note, however that what constitutes drug or psychoactive substance abuse among adolescents—any use at all or "problem use"—is a matter of controversy. As noted below, the U.S. Department of Health and Human Service's Office for Substance Abuse Prevention (OSAP) is of the view that any use is abuse. The American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders*, 3rd ed., revised (DSM-III-R), draws distinctions between substance use, substance abuse, and substance dependence.[1]

Office for Substance Abuse Prevention

OSAP's view is that any drug use, including alcohol use, by those under 21 is to be prevented (310).

National Institute on Drug Abuse

In discussing the results of its 1988 Household Survey on Drug Abuse, NIDA argued that frequency of drug use in the last year might be the most appropriate indicator of drug abuse (303). A separate definition of abuse among adolescents was not offered.

For the purpose of emergency rooms and medical examiners reporting to NIDA's Drug Abuse Warning Network (DAWN) system, drug abuse is defined as "the nonmedical use of a substance for psychic effect, dependence, or suicide attempt/gesture" (302). According to NIDA's 1988 DAWN report, nonmedical use includes the following:

- the use of prescription drugs in a manner inconsistent with accepted medical practice;
- the use of over-the-counter drugs contrary to approved labeling; or
- the use of any other substance (heroin, marijuana, peyote, glue, aerosols, etc.) for psychic effect, dependence, or suicide (302).

American Psychiatric Association, DSM-III-R

The American Psychiatric Association's DSM-III-R notes that "In our society, use of certain substances to modify mood or behavior under certain circumstances is generally regarded as normal and appropriate" (4).[2] The DSM-III-R diagnostic class "Psychoactive Substance Use Disorders" deals with "symptoms and maladaptive behavioral changes associated with more or less regular use of psychoactive substances that affect the central nervous system" (4). DSM-III-R notes that the behavioral changes used as criteria "would be viewed as extremely undesirable in almost all cultures" (4).

Listed below are the DSM-III-R criteria for diagnosing two categories of psychoactive substance use disorders as mental disorders[3]: 1) "psychoactive substance abuse disorder," and 2) "psychoactive substance dependence

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[1] It is important to note that the development of diagnostic criteria for mental disorders is a continuously evolving endeavor. The first edition of the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders* appeared in 1952; working groups of the American Psychiatric Association are currently working on DSM-IV (4). Classifications of mental disorders can also be found in the International Classification of Disorders (ICD) of the World Health Organization, currently being revised for a 10th edition (4). According to the American Psychiatric Association: "The purpose of DSM-III-R is to provide clear descriptions of diagnostic categories in order to enable clinicians and investigators to diagnose, communicate about, study, and treat the various mental disorders. . . The specified diagnostic criteria for each mental disorder are offered as *guidelines* for making diagnoses, since it has been demonstrated that the use of such criteria enhances agreement among clinicians and investigators.,..These diagnostic criteria and the DSM-III-R classification of mental disorders reflect a consensus of current formulations of evolving knowledge. . .but do not encompass all the conditions that may be legitimate objects of treatment or research efforts" (4, italics added).

[2] DSM-III-R also notes that there are wide cultural variations in the United States and that "in some groups even the recreational use of alcohol is frowned upon, whereas in other groups the use of various illegal substances for mood-altering effects has become widely accepted. In addition, certain psychoactive substances are used medically for the alleviation of pain, relief of tension, or to suppress appetite" (4).

[3] Just as no definition adequately specifies precise boundaries for the concepts "physical disorder" and "physical health," there are no precise boundaries for the concepts "mental disorder" or "mental health" (4). Nevertheless, the American Psychiatric Association found it useful to present a definition of mental disorder that influenced the decision to include certain conditions in. . .DSM-III-R, as follows: ". . .a clinically significant behavioral or psychological syndrome or pattern that occurs in a person and that is associated with present distress (a painful symptom) or with a significantly increased risk of suffering death, pain, disability, or an important loss of freedom. In addition, this syndrome or pattern must not be merely an expectable response to a particular event, e.g., the death of a loved one. Whatever its original cause, it must currently be considered a manifestation of a behavioral, psychological, or biological dysfunction in the person. Neither deviant behavior, e.g., political, religious, or sexual, nor conflicts that are primarily between the individual and society are mental disorders unless the deviance or conflict is a symptom of a dysfunction in the person, as described above" (4).

Mental health and mental disorders in adolescents are discussed more generally in ch. 11, "Mental Health Problems: Prevention and Treatment," in this volume.

Continued on next page

Box 12-B—What Constitutes Substance Abuse by Adolescents?—Continued

disorder." (Dependence is deemed to be more serious than abuse, in part because it involves a longer-term and more pervasive behavioral pattern.)[4]

Separate DSM-III-R criteria are not available for adolescents.

DSM-III-R Diagnostic Criteria for Psychoactive Substance Abuse

A. A maladaptive pattern of psychoactive substance use indicated by at least one of the following:

- continued use despite knowledge of having a persistent or recurrent social, occupational, psychological, or physical problem that is caused or exacerbated by use of the psychoactive substance;
- recurrent use in situations in which use is physically hazardous (e.g., driving while intoxicated).

B. Some symptoms of the disturbance have persisted for at least 1 month or have occurred repeatedly over a long period.

C. Never met the criteria for psychoactive substance dependence (see below) for this substance.

DSM-III-R Diagnostic Criteria for Psychoactive Substance Dependence

A. At least three of the following:

- substance often taken in larger amounts or over a longer period than the person intended;
- persistent desire or one or more unsuccessful efforts to cut down or control substance use;
- a great deal of time spent in activities necessary to get the substance (e.g., theft), taking the substance (e.g., chain smoking), or recovering from its effects;
- frequent intoxication or withdrawal symptoms when expected to fulfill a major role obligation at work, school, or home (e.g., does not go to work because hung over, goes to school or work "high," intoxicated while taking care of his or her children), or when substance use is physically hazardous (e.g., drives when intoxicated);
- important social, occupational, or recreational activities given up or reduced because of substance abuse;
- continued substance abuse despite knowledge of having a persistent or recurrent social, psychological, or physical problem that is caused or exacerbated by the use of the substance (e.g., keeps using heroin despite family arguments about it, cocaine-induced depression, or having an ulcer made worse by drinking);
- marked tolerance, i.e., need for markedly increased amounts of the substance (at least 50 percent increase) in order to achieve intoxication or desired effect, or markedly diminished effect with continued use of the same amount.
- characteristic withdrawal symptoms (see specific withdrawal syndromes under psychoactive substance-induced organic mental disorders in DSM-III-R);[5]
- substance often taken to relieve or avoid withdrawal symptoms.[5]

B. Some symptoms of the disturbance have persisted for at least 1 month or have occurred repeatedly over a longer period of time.

In addition to criteria for diagnosing the presence of psychoactive substance dependence, DSM-III-R stipulates criteria for severity of psychoactive substance dependence from mild (few, if any, symptoms in excess of those required to make the diagnosis, and the symptoms result in no more than mild impairment in occupational functioning or in usual social activities or relationships with others) to severe (many symptoms in excess of those required to make the diagnosis, and the symptoms markedly interfere with occupational functioning or with usual social activities or relationships with others[6]). Clients may also be in partial remission (during the past 6 months, some use of the substance and some symptoms of dependence) or in full remission (during the past 6 months, either no use of the substance, or use of the substance and no symptoms of dependence).

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[4] DSM-III-R distinguishes these *behaviorally defined* disorders from another set of mental disorders called "Psychoactive Substance-induced Organic Mental Disorders," a set of disorders caused by the direct effects of various psychoactive substances on the nervous system. "Psychoactive Substance-induced Organic Mental Disorders" include intoxication, withdrawal, delirium, withdrawal delirium, delusional disorder, mood disorder, and other syndromes and differ depending on the substance used. Thus, the criteria for diagnosing these organic disorders are not described here. In most cases, according to DSM-III-R, "the diagnosis of these Organic Mental Disorders will be made in people who also have a psychoactive substance use disorder (4).

[5] DSM-III-R notes that these criteria may not apply to cannabis, hallucinogens, or PCP (phencyclidine).

[6] Because of the availability of cigarettes and other nicotine-containing substances and the absence of a clinically significant nicotine intoxication syndrome, impairment in occupational or social functioning is not necessary for a rating of severe nicotine dependence.

SOURCE: Office of Technology Assessment, 1991.

dependence are illegal for general sale, purchase, or consumption regardless of age—among them heroin, cocaine, and inhalants such as amyl and butyl nitrite, which are short-acting vasodilators.[5]

Trends in the Use of Psychoactive Substance Use by U.S. Adolescents

Sources of Data on the Incidence and Prevalence of Psychoactive Substance Use

Sources of data on the incidence and prevalence of psychoactive substance use by U.S. adolescents include self-report data from household and other surveys sponsored by NIDA and others and also include data from emergency rooms and data on arrests.

Surveys That Collect Self-Report Data on Psychoactive Substance Use—Various national and other surveys discussed below have asked adults and adolescents in the United States about their use of alcohol, tobacco, and other drugs:

- the NIDA Household Survey on Drug Abuse;
- the Monitoring the Future/High School Seniors Survey[6] conducted by researchers at the Institute for Social Research at the University of Michigan with NIDA's support;
- the National Adolescent Student Health Survey conducted in 1987 by a consortium of groups funded partially by the Federal Government;
- the National PRIDE Survey sponsored by the National Parents' Resource Institute for Drug Education;
- the Youth Risk Behavior Surveillance System (YRBSS) of the Centers for Disease Control (CDC) within the Public Health Service of DHHS; and
- regional surveys such as those by the University of Minnesota's Adolescent Health Program.

NIDA's Household Survey on Drug Abuse has been conducted 10 times between 1971 and 1990 (303,306). The Monitoring the Future/High School Seniors Survey has been conducted every year since 1975 (288,300). Other surveys—e.g., the National Adolescent Student Health Survey (5) and the National PRIDE Survey (206)—have been conducted only once.

Available data on the prevalence and incidence of substance use and abuse by adolescents have major limitations. For one thing, almost all estimates of the prevalence, incidence, and trends in substance use by U.S. adolescents rely on self-reports. Self-reports are inherently subject to both faking and unintended biases in reporting due to respondents' potential needs to provide socially desirable answers (13,162, 184). Any reported changes in substance use over time, therefore, may be due in part to changes in the social acceptability of psychoactive substances in general or of any particular substance. On the other hand, Bachman and his colleagues have argued that declines in the social acceptability of drug use have had an impact on drug use, and that the declines seen in the 1980s are therefore "real" (11). Their argument is buttressed by the fact that there have been increases in the use of some drugs that have not been the target of recent public attention (e.g., inhalants [288,289]), that arrests of adolescents for drug violations have more or less tracked trends in drug use (322), and that there is some evidence that adolescents' emergency room visits for drug-related reasons are down (301,302,304).[7] There remains, however, persistent discomfort with reliance on self-report data, and recognition of the need to use sources of information other than self-reports, in judging the prevalence of drug use in the United States. Two sources of such data are discussed following brief overview of available self-report surveys.

NIDA Household Survey on Drug Abuse—The NIDA Household Survey on Drug Abuse measures the prevalence of drug use among the American household population age 12 and over. Although local surveys and clinical experience have found that adolescents who are homeless or institutionalized typically have higher rates of psychoactive substance use than do adolescents living at home, homeless and institutionalized adolescents have not been systematically surveyed by NIDA.[8] The NIDA Household Survey questions adolescents in their own homes; what impact this approach has on the results is not known. In addition, the NIDA Household Survey questions only 12- to 17-year-olds and does not include younger adolescents (e.g., 10- and 11-year-olds). Further, the sample of adolescents the NIDA Household Survey has surveyed has been quite small (3,095 in 1988; 2,177 in 1990); as a consequence, disaggregations of the data by adolescent age are not feasible, and only averages of 12- to 17-year-olds combined are possible. The number of Hispanics and nonwhites surveyed in the NIDA Household Survey is also small (747 black adolescents, 763 Hispanic adolescents, and 67 "other" nonwhite adolescents in 1988) (303). DHHS is planning to expand the number of individuals surveyed in the NIDA Household Survey on Drug Abuse (326,327).

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[5] *Vasodilators* are agents that cause the dilation (enlargement) of the blood vessels.

[6] The Monitoring the Future/High School Seniors Survey is technically entitled "Monitoring the Future: A Continuing Study of the Lifestyles and Values of Youth." The survey studies a sample of all seniors in public and private high schools in the coterminous United States and also includes samples of young adults from previous graduating classes, who are administered followup surveys by mail.

[7] As discussed below, drug use data from the NIDA surveys of emergency rooms are notoriously difficult to compare over time because of methodological problems and frequent changes in methodology.

Monitoring the Future/High School Seniors Survey—The Monitoring the Future/High School Seniors Survey (288,289) has long been criticized for having as its youngest respondents high school seniors. By not surveying younger students and students who are not in school, this survey has provided no information about drug use by students other than seniors or about adolescents who have dropped out of school prior to their senior year. There is some evidence that school dropouts are more likely than current students to use psychoactive substances.[9] Another limitation of the Monitoring the Future/High School Seniors Survey is that it does not sample sufficient numbers of nonwhite students for distinctions by race and ethnicity to be made on a routine basis. An expansion of the Monitoring the Future/High School Seniors Survey is planned, in that future surveys will include younger adolescents as well as seniors (327).

National Adolescent Student Health Survey—In 1987, DHHS, in an attempt to ascertain the prevalence of a wide range of health-compromising behaviors and attitudes among younger students, helped support a survey of 8th and 10th graders conducted by the American School Health Association, the Association for the Advancement of Health Education, and the Society for Public Health Education (5). Although the National Adolescent Student Health Survey sampled younger adolescents than does the Monitoring the Future/High School Seniors Survey, it too was limited to those adolescents still attending school.

National P[illegible]DE Survey—The National PRIDE Survey was based on a survey questionnaire devised by the parents' group, National Parents' Resource Institute for Drug Education (206). The validity of the questionnaire design is unknown. The National PRIDE survey, conducted in the 1988-89 school year, has the advantage of including adolescents in grades below the eighth grade, but the questionnaire was not distributed to a representative sample of schools. Only schools that were interested participated in the survey; further, participating schools had the option of not reporting results back to the National PRIDE office.

Youth Risk Behavior Surveillance System (YRBSS)—Reports of averages from national surveys are controversial because they may seem to underestimate the use of drugs in particular locations. CDC is beginning to support the collection and reporting of data from cities and States (e.g., 314). Reporting of such local data suggests the wide variation in drug use across localities (314). Comparisons among localities are sometimes difficult, however, because these surveys also rely on school-based data and the voluntary participation of localities.[10] The Division of Adolescent and School Health in CDC is now supporting YRBSS (318). YRBSS will be administered locally and will also generate national data. Questions about drug and alcohol use are included in the survey, which will be administered to students in 9th through 12th grades.[11]

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[8] For a further discussion of homeless adolescents, see ch. 14, "Homelessness: Prevention and Services," in this volume. The health problems of adolescents in juvenile justice facilities are discussed in ch. 13, "Delinquency: Prevention and Services," in this volume.

[9] For a discussion of school dropouts, see ch. 4, "Schools and Discretionary Time," in this volume.

[10] Because of their focus on behaviors associated with infection with the human immunodeficiency virus (HIV)—the virus associated with the acquired immunodeficiency syndrome (AIDS)—early reports from these surveys focused only on certain aspects of drug use (e.g., intravenous drug use). Future YRBSS surveys will ask about a wider range of drugs (318). AIDS and HIV infection in U.S. adolescents are topics addressed in ch. 9, "AIDS and Other Sexually Transmitted Diseases: Prevention and Services," in this volume.

[11] In addition, the National Center for Health Statistics (NCHS) within DHHS is planning to implement a Youth Risk Behavior Supplement to the National Health Interview Survey (NHIS) in the years 1991, 1995, and 2000 (318). The NHIS Youth Risk Behavior Supplement will be administered to adolescents who attend school and adolescents who do not. NHIS is discussed further in ch. 6, "Chronic Physical Illnesses: Prevention and Treatment," in this volume.

The Minnesota Adolescent Health Survey—In 1984, the Federal Office of Maternal and Child Health in DHHS' Health Resources and Services Administration awarded a grant to the Minnesota Department of Health to work with the University of Minnesota Adolescent Health Program (also funded by the Office of Maternal and Child Health) to establish a comprehensive adolescent health database in Minnesota for use by the State of Minnesota and local Minnesota communities (327c). As part of establishing such a database, the University of Minnesota Adolescent Health Program conducted a survey of over 36,000 public school students in grades 7 through 12 in 86 Minnesota school districts during the 1986-87 school year. As part of this broad-ranging health survey, questions were asked about the use of cigarettes, chewing tobacco, beer, wine, hard liquor, and illicit drugs (any illicit drugs, marijuana, cocaine, crack, amphetamines). This survey is limited by being a self-report survey representative only of Minnesota adolescents of approximately ages 12 (7th grade) through 18 (12th grade) who attend school, but its comprehensiveness and large sample size may make it a useful model for expansion into other groups of adolescents and communities.[12]

In general, local and national survey data would be more useful if they reflected the use of multiple drugs as well as the use of single drugs. Some studies of limited numbers of adolescents suggest that adolescents are likely to use more than a single drug, but these studies do not report frequency of use. For example, one Los Angeles County study reported that 60 percent of high school and first-year-post-high school respondents were multiple drug users, but it did not report frequency of use; thus, individuals who may have used multiple drugs only one time in the preceding 6 months would be included in the 60 percent (176).[13]

NIDA's Drug Abuse Warning Network (DAWN) System—NIDA's DAWN system is a source of information about alcohol and other drug use that is potentially relevant to problem drug use by adolescents (302,304). NIDA's DAWN system supports the collection of data on emergency room visits and deaths related to drug use. A sample of hospital emergency rooms and medical examiner facilities report to the DAWN system data for each "drug abuse" patient or death encountered by medical examiners. The DAWN system is designed primarily as an early warning system to monitor drug abuse patterns and health hazards associated with drug use, and to detect new abuse entities and new combinations of drugs of abuse.

One problem with DAWN data prior to 1990 was that the data were collected from a nonrandom sample of hospital emergency rooms and medical examiner facilities in metropolitan areas selected *because* of a high probability of problem drug use.[14] Beginning in 1990, DAWN data were collected from a national probability sample of emergency rooms (304,327). This change will make DAWN data more nationally representative, and make accurate national comparisons of data over time possible.

As noted in box 12-B, for the purpose of reporting to the DAWN system, drug abuse is defined as "the nonmedical use of a substance for. . . psychic effect, dependence, or suicide attempt/gesture" (302). Some would agree that a limitation of the DAWN system (apart from its being based in the past it on a rather small and nonrandom sample of responding facilities) is its rather broad definition of nonmedical use of drugs. Nonmedical use of drugs is defined as the following:

- the use of prescription drugs in a manner inconsistent with accepted medical practice;
- the use of over-the-counter drugs contrary to approved labeling; or
- the use of any other substance (heroin, marijuana, peyote, glue, aerosols, etc.) for psychic effect, dependence, or suicide.

The first two uses could be accidental and might not be considered drug abuse by some definitions. To compensate, the DAWN system disaggregates episodes by motive (e.g., psychic effects, recreational use, dependence, suicide) and type of drug, but the breakdowns do not allow motives to be analyzed in relation to types of drugs. A further limitation of DAWN is that the drug mentions reported are not necessarily the cause of the medical emergency. Multiple drugs may be reported by a patient or detected by the health care provider in the emergency room. Similarly, only one drug motive is attached to an episode, and that motive is assigned to each separate drug mentioned in the episode. Thus, some caution must be exercised when attempting to relate drug mention patterns to specific motives.

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[12] Variations of the Minnesota survey were administered by the University of Minnesota Adolescent Health Program to adolescents in a number of American Indian and Alaska Native communities. Reports from the pilot phase of the Indian surveys can be found in OTA's 1990 report *Indian Adolescent Mental Health* (286).

[13] The National Adolescent Student Health Survey asked adolescents whether they had used alcohol in combination with other drugs, but it did not report responses to this question (5).

[14] In 1987, for example, data were collected from 610 emergency rooms and 75 medical examiner facilities in 27 large metropolitan areas (e.g., Atlanta, Baltimore, Boston, Buffalo, Chicago, Cleveland, New York, Oklahoma City, Seattle, Washington, DC); these areas accounted for one-third of the U.S. population (301). In addition, a "national panel" of 146 emergency rooms was newly added to the DAWN sample in 1987; the national sample was not randomly selected.

Federal Bureau of Investigation Data on Arrest Rates—As discussed elsewhere in this Report, the Uniform Crime Reports program maintains arrest data reported by local law enforcement agencies to the Federal Bureau of Investigation in the U.S. Department of Justice (323).[15] Uniform Crime Reports data offer several advantages—they cover more types of offenses that data from other sources, they cover offenses committed by individuals of all ages, and they are up-to-date and easy to interpret. One limitation of these data, however, is that they may be affected by underreporting by law enforcement officials, particularly, underreporting of less serious offenses (183). Another limitation is that they may be affected by law enforcement agencies' bias toward the detection and arrest of offenders from certain groups in society (e.g., black male adolescents), and for certain categories of offense (180a). Furthermore, the use of arrest rate data to detect trends over time remains problematic. One reason is that law enforcement agencies may focus on different types of offenses in different historical periods (e.g., a drug crisis may limit resources available for the detection of other types of crimes); another reason is that changes may occur in the definitions of offenses.

A problem related to these limitations is that the category "drug abuse violations" comprises a rather broad range of offenses. Drug abuse violations are State and local offenses related to the unlawful possession, sale, use, growing, and manufacturing of narcotic drugs (323). Because drug users may be a different population than drug dealers and drug dealers may sell to nonadolescents, arrest data are not good overall indicators of adolescent drug use.[16]

Current Estimates of the Prevalence of Psychoactive Substance Use Among U.S. Adolescents Based on Self-Report Data

"Lifetime Use" of Psychoactive Substances—Current data suggest that a substantial percentage of U.S. adolescents will use alcohol, nicotine in the form of cigarettes or smokeless tobacco, or some other psychoactive substance, at least once during adolescence. As shown in table 12-1, alcohol and cigarettes are the two substances that U.S. adolescents are most likely to report ever having used. About 50 percent of 12- to 17-year-olds responding to the 1988 NIDA Household Survey on Drug Abuse[17] reported using alcohol at least once in their lives (303); 90 percent of high school seniors responding to the 1989 Monitoring the Future/High School Seniors Survey reported using alcohol at least once (288). Other than alcohol, tobacco is the substance most likely to be tried by U.S. adolescents, with about two-thirds of high school seniors in 1989 reporting having smoked cigarettes at least once in their lives (288). Forty-four percent of high school seniors in 1989 reported that they had tried marijuana at least once; 19 percent had used stimulants; 18 percent had used inhalants; 10 percent had used cocaine; and 10 percent had used hallucinogens, primarily LSD (lysergic acid diethylamide), (8.3 percent). Seven percent of high school seniors

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[15] See ch. 13, "Delinquency: Prevention and Services," in this volume.

[16] Only eight sites (Los Angeles, CA; San Diego, CA; San Jose, CA; Portland, OR; Indianapolis, IN; St. Louis, MO; Cleveland, OH; Washington, DC) in the U.S. Department of Justice, Office of Justice Programs, National Institute of Justice's Drug Use Forecasting system test juvenile arrestees and detainees for the presence of drugs in their systems (323a). Hence, national estimates of drug *use* by juvenile arrestees and detainees are not possible. In the period April through June 1990, from 8 percent (San Jose, CA) to 37 percent (Los Angeles, CA) of juvenile arrestee/detainees tested positive for at least one of the following drugs: cocaine, opiates, PCP, marijuana, amphetamines, methadone, methaqualone, benzodiazepines, barbiturates, and propoxyphene. Some sites do not test for methadone, methaqualone, and propoxyphene (323a). (Propoxyphene [Darvon®] is a prescription analgesic structurally similar to methadone (147).) Other data, discussed in ch. 13, "Delinquency: Prevention and Services," in this volume, suggest a high prevalence of alcohol and drug abuse problems, and nearly universal use of tobacco among adolescents incarcerated in juvenile justice facilities. It is important to note that drug use data from adolescents involved with the juvenile justice system pertain to arrests and incarcerations for many types of offenses, not just drug use or drug sales.

[17] OTA focused on adolescents ages 10 through 18. NIDA Household Survey on Drug Abuse data are not readily available for this age group and are therefore presented for individuals ages 12 to 17.

Table 12-1—Percentage of Surveyed U.S. Adolescents of Different Ages Reporting Ever Having Used Alcohol or Other Types of Psychoactive Substances

	Percentage of respondents reporting ever having used			
	NIDA Household Survey on Drug Abuse, 1988	National Adolescent Student Health Survey, 1987		Monitoring the Future/High School Seniors Survey, 1989
	12- to- 17 year-olds[a]	8th graders	10th graders	High school seniors
Alcohol	50.2%	77.4%	88.8%	90.7%
Cigarettes	42.3	50.8	63.5	65.7
Marijuana/hashish	17.4	14.5	35.1	43.7
Smokeless tobacco/snuff	14.9	NA	NA	NA
Inhalants	8.8	20.6	20.6	17.6
Nonmedical use of stimulants	4.2	9.0[b]	15.7[b]	19.1
Nonmedical use of analgesics	4.2	NA	NA	NA
Hallucinogens (all forms)	3.5	2.6	6.7	9.9
Cocaine (all forms)	3.4	3.6	7.7	10.3
Nonmedical use of sedatives	2.4	NA	NA	7.4
Nonmedical use of tranquilizers	2.0	NA	NA	7.6
PCP	1.2	NA	NA	3.9
Crack cocaine	0.9	1.6	2.7	4.7
Heroin	0.6	NA	NA	1.3
LSD	NA	NA	NA	8.3
Needle use	0.4	0.9[c]	0.5[c]	NA

KEY: NA = not available.

[a] Sample size is too small to disaggregate by single year of age.

[b] Includes over-the-counter as well as prescription (e.g., amphetamines) drugs.

[c] Information collected on needle use for injection of cocaine only.

SOURCE: Office of Technology Assessment, 1991, based on data from the following sources: **NIDA Household Survey on Drug Abuse:** U.S. Department of Health and Human Services, Public Health Service, Alcohol, Drug Abuse, and Mental Health Administration, National Institute on Drug Abuse, *National Household Survey on Drug Abuse: Main Findings 1988*, DHHS Pub. No. (ADM) 90-1682 (Rockville, MD: 1989). **National Adolescent Student Health Survey:** American School Health Association, Association for the Advancement of Health Education, Society for Public Health Education, Inc., *The National Adolescent Student Health Survey: A Report on the Health of America's Youth* (Oakland, CA: Third Party Publishing, 1989). **Monitoring the Future/High School Seniors Survey:** U.S. Department of Health and Human Services, data from the 1989 "Monitoring the Future Survey" of drug abuse among U.S. high school seniors (conducted by the Institute for Social Research, University of Michigan, and funded by the National Institute on Drug Abuse), *HHS News*, Feb. 13, 1990.

reported that they had ever used sedatives and/or tranquilizers nonmedically (288).[18]

Information collected with the support of the CDC suggests that there may be considerable variation by locale in the percentage of U.S. adolescent students who have ever used drugs intravenously. As shown in table 12-2, in 1988 in the District of Columbia, for example, almost 5 percent of female students and 9 percent of male students ages 13 to 18 reported having administered drugs (cocaine, heroin, or other illegal drugs) intravenously at some point in their lives (314). The proportions were somewhat lower in schools in the other localities that permitted their data to be published. Because localities were permitted to administer questionnaires to whichever schools and students they deemed appropriate, it is difficult to make comparisons among localities.

Frequent and Substantial Use of Psychoactive Substances—As noted at the beginning of this chapter, different segments of society differ with respect to their conceptualizations of what constitutes substance abuse for adolescents (see box 12-B). Unless one believes that *any* use of psychoactive substances by adolescents is problem use or abuse (310), it is important to determine when substance use becomes problem use or abuse. Such determinations are difficult. Typically, available survey data are not particularly helpful in distinguishing occasional substance use from problem use or abuse.

As shown in table 12-3, about one-third of high school seniors reporting to the 1989 Monitoring the

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[18] The 1990 Monitoring the Future/High School Seniors Survey found some small, but statistically significant, decreases between 1989 and 1990 in the percentage of high school seniors reporting having ever used any illicit drugs, any illicit drug other than marijuana, marijuana/hashish, amyl and butyl nitrite, crack, stimulants, and sedatives (289).

Table 12-2—Percentage of U.S. Adolescent Students in Selected Cities and States Reporting Ever Having Used Drugs Intravenously, by Sex, Age Group, 1988

	Percentage reporting ever having used drugs intravenously					
	Gender			Age group (yrs)		
City/State	Total	Female	Male	13-14	15-16	17-18
California	4.1%	2.6%	5.7%	2.8%	3.9%	4.3%
Washington, DC	6.3	4.6	8.7	*	4.0	8.9
Michigan	2.8	2.1	3.4	3.2	3.2	1.3
San Francisco	3.7	2.4	5.1	1.4	3.9	2.4

* Less than 5 percent of subgroup in sample.

SOURCE: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, "HIV-Related Beliefs, Knowledge, and Behaviors Among High School Students," *Morbidity and Mortality Weekly Report* 37:717-721, Dec. 2, 1988.

Table 12-3—Current Estimates of Heavy Use of Alcohol Among U.S. Adolescent Students[a]

	Percentage of respondents reporting			
	National Adolescent Student Health Survey, 1987			Monitoring the Future/High School Seniors Survey, 1989
Number of times in the past 2 weeks had five or more drinks[b]	8th graders	10th graders	Total sample	High school seniors
0 times	73.8%	61.8%	67.6%	67.0%
1 time	12.5	15.8	14.3	11.1
2 times	6.4	7.8	7.2	8.3
3-5 times	4.1	8.5	6.4	9.0
6-9 times	1.4	3.0	2.2	2.7
10+ times	1.7	3.0	2.2	1.9

[a] In the 1988 National Household Survey on Drug Abuse, NIDA defined "heavy use of alcohol" as drinking five or more drinks on the same occasion (i.e., within a few hours) on 5 or more days in the past 30 days.

[b] The wording is had five or more drinks "on one occasion" in the National Adolescent Student Health Survey; it is having had five or more drinks "in a row" in the Monitoring the Future/High School Seniors Survey.

SOURCE: Office of Technology Assessment, 1991, based on data from the following sources: **National Adolescent Student Health Survey:** American School Health Association, Association for the Advancement of Health Education, Society for Public Health Education, Inc., *The National Adolescent Student Health Survey: A Report on the Health of America's Youth* (Oakland, CA: Third Party Publishing, 1989). **Monitoring the Future/High School Seniors Survey:** U.S. Department of Health and Human Services, data from the 1989 "Monitoring the Future Survey" of drug abuse among U.S. high school seniors (conducted by the Institute for Social Research, University of Michigan, and funded by the National Institute on Drug Abuse), *HHS News*, Feb. 13, 1990.

Future/High School Seniors Survey and a similar proportion of the 8th and 10th graders reporting to the 1987 National Adolescent Student Health Survey said that they had had five or more alcoholic drinks on at least one occasion in the 2 weeks prior to the survey period (5,304). Many of the students surveyed—7.2 percent of the 8th graders (5), 14.5 percent of 10th graders (5), and 13.9 percent of the high school seniors (304)—reported having had five or more drinks on *three or more* occasions in the previous 2 weeks. Apparently, such patterns of consumption have led some adolescents themselves to assert that alcohol use is the most prevalent problem among students (3).

Nicotine is used by a significant number of adolescents—most commonly in the form of cigarettes. As shown in table 12-4, nearly 6 percent of 10th graders surveyed in the 1987 National Adolescent Student Health Survey reported smoking more than five packs of cigarettes a month. Nineteen percent of high school seniors surveyed in 1989 reported some cigarette smoking on a daily basis (from one cigarette per day [7.7 percent] to two packs or more per day [0.3 percent]).

Some adolescents use nicotine in the form of smokeless tobacco. Although the regular use of smokeless tobacco can have significant health consequences (320), national surveys such as NIDA's Household Survey on Drug Abuse and the Monitoring the Future/High School Seniors Survey do not request information about smokeless tobacco use. As shown in table 12-5, the one-time National

Table 12-4—Current Estimates of Heavy Cigarette Smoking Among U.S. Adolescent Students

	Percentage of respondents reporting			
	National Adolescent Student Health Survey, 1987			Monitoring the Future/High School Seniors Survey, 1989
Cigarettes smoked in past month	8th graders	10th graders	Total sample	High school seniors
None	83.9%	73.6%	78.6%	71.4%
1-4 total for month	7.7	9.1	8.4	NA
5-19 total for month	3.1	4.9	4.0	NA
1-5 packs total for month	2.9	6.5	4.8	NA
> 5 packs total for month	2.4	5.9	4.2	NA
Less than 1 cigarette a day	NA	NA	NA	9.7
1-5 cigarettes per day	NA	NA	NA	7.7
About 1/2 pack/day	NA	NA	NA	5.4
About 1 pack/day	NA	NA	NA	4.4
About 1 1/2 packs/day	NA	NA	NA	1.1
Two packs or more/day	NA	NA	NA	0.3

KEY: NA = not available.

SOURCE: Office of Technology Assessment, 1991, based on data from the following sources: **National Adolescent Student Health Survey**: American School Health Association, Association for the Advancement of Health Education, Inc., *The National Adolescent Student Health Survey: A Report on the Health of America's Youth* (Oakland, CA: Third Party Publishing, 1989): **Monitoring the Future/High School Seniors Survey**: U.S. Department of Health and Human Services, data from the 1989 "Monitoring the Future Survey" of drug abuse among U.S. high school seniors (conducted by the Institute for Social Research, University of Michigan, and funded by the National Institute on Drug Abuse), *HHS News*, Feb. 13, 1990.

Adolescent School Health Survey found that an average of 4.4 percent of 10th grade males (2.4 percent of 10th grade males and females combined) used smokeless tobacco daily (5). The University of Minnesota's 1986-87 Adolescent Health Survey found that 15 percent of male students in the 12th grade were using smokeless tobacco daily (191).

Most U.S. adolescents do not use *illicit drugs*[19] with great frequency. If one considers daily use of a psychoactive substance as an indicator of problem use, for example, one finds that less than 1 percent of adolescent students report using any *illicit drug other than marijuana* on a daily basis (see table 12-5).[20] For example, from 0.3 to 0.6 percent of respondents reported using *cocaine* in any form daily in the last month or year in various surveys during the 1987-89 period. In 1989, 2.9 percent of high school seniors reported using *marijuana* on a daily basis. The fact that less than 1 percent of adolescents appear to be using any specific illicit drug other than marijuana on a daily basis should not be dismissed lightly, however; 0.5 percent of 12- to 17-year-olds in 1988 was equal to 100,000 adolescents.

Not surprisingly, somewhat more U.S. adolescents report using an illicit drug less frequently than daily but more than "ever." For example:

- 3.9 percent of 12- to 17-year-old respondents to the 1988 NIDA Household Survey and 5.5 percent of respondents to the 1988-89 National PRIDE Survey reported having used *marijuana* once a week or more in the past year.
- Three-tenths of 1 percent of 10th graders and high school seniors had used *crack cocaine* 20 or more times in the past month.
- From 0.9 percent to 1.4 percent of respondents (depending on the survey) had used *crack cocaine* at least once in the month preceding the survey.
- From 0.6 to 2.2 percent of student respondents, depending on the survey, had used *hallucinogens* 10 to 12 or more times in the year preceding the surveys.

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[19] For purposes of this Report, and to be consistent with usage in the NIDA Household Survey on Drug Abuse (303) and the Monitoring the Future/High School Seniors Survey (300), the term *illicit drugs* refers to drugs that are illegal for everyone in the United States and the nonmedical use of prescription drugs. Illicit drugs include marijuana, inhalants, cocaine, hallucinogens, heroin and the nonmedical use of psychotherapeutics (sedatives, tranquilizers, stimulants, or analgesics) (303).

[20] It may be important to note that the data in table 12-5 come from surveys of adolescents in school. The NIDA Household Survey on Drug Abuse, which is population-based rather than school-based, does not ask respondents about daily use.

Table 12-5—Summary of Daily Use of Alcohol, Tobacco, and Illicit Drugs by U.S. Adolescent Students of Various Ages

	National surveys[b]					
	Junior high school		Senior high school		High school seniors only[g]	Regional/local surveys
Drug[a]	PRIDE[c] survey (1988-89)	NASHS[d] [e] (1987)	PRIDE[c] survey (1988-89)	NASHS[e] [f] (1987)	Monitoring the Future/ High School Seniors Survey (1989)	Minnesota Adolescent Health Survey (1986-87)
Alcohol	0.8	0.6%	1.1	2.0%	4.2	NA
Cigarettes	5.7%	NA	10.6%	NA	18.9%[h]	12.0%
Marijuana/hashish	0.8	0.4	2.3	2.1	2.9	2.0
Smokeless tobacco/snuff	NA	1.3[i]	NA	2.4[i]	NA	3.8
Inhalants	0.6	0.6	0.6	0.6	0.3[b]	NA
Nonmedical use of stimulants[k]	0.5[m]	0.3[n] 0.4[o] 0.4[p]	0.8[m]	0.4[n] 0.3[o] 0.6[p]	0.3[b]	NA
Nonmedical use of analgesics[k]	NA	NA	NA	NA	NA	NA
Hallucinogens (all forms)	0.4	0.4[j]	0.5	0.3[j]	0.3[b]	NA
Cocaine (all forms)	0.4	0.3	0.6	0.4	0.3	NA
Nonmedical use of sedatives[k]	0.4[l]	NA	0.5[l]	NA	0.1	NA
Nonmedical use of tranquilizers[k]	—[l]	NA	—[l]	NA	0.1	NA
PCP	NA	NA	NA	NA	0.2	NA
Crack cocaine	NA	0.1	NA	0.3	0.2	NA
Heroin	NA	NA	NA	NA	0.1	NA
LSD	NA	NA	NA	NA	0.0	NA
Amyl or butyl nitrite	NA	0.6	NA	0.4	NA	NA
Combinations of alcohol and other drugs	NA	NA	NA	NA	NA	NA
"Other drugs"	1.8	NA	2.0	NA	NA	NA

KEY: NA = not available; PRIDE = Parents' Resource Institute for Drug Education; NASHS = National Adolescent Student Health Survey.

[a] Drugs are listed in roughly the same order as in table 12-1, where drugs were listed to reflect the prevalence of their use by U.S. adolescents as determined in the 1988 NIDA Household Survey on Drug Abuse. The categories "Amyl or butyl nitrite," "Combinations of alcohol and other drugs," and "Other drugs" were not listed in table 12-1 and are therefore shown last in this table.

[b] "Adjusted" figures are used. Adjusted figures are higher than unadjusted figures.

[c] Figures shown are the average of grades 6 through 9. Interestingly, for almost all types of drugs, daily use in 6th grade appeared higher than use in 7th, 8th, or 9th grades. However, the number of respondents was lowest for 6th graders (half or less than in any other grade except 12th), a factor which could affect the statistical significance of any differences. In general, the survey method would not meet generally accepted standards, and no tests of statistical significance were conducted.

[d] The figures shown are for eighth graders only.

[e] In the National Adolescent Student Health Survey, respondents were not asked about daily use, but they were asked about the number of occasions particular drugs had been used in "the past month." The percentage reporting either 20 to 39 times or 40+ times are included here as daily use.

[f] Tenth graders only.

[g] In the Monitoring the Future/High School Seniors Survey, "daily use" means daily use in the past 30 days.

[h] This figure reflects any level of cigarette smoking on a daily basis. A total of 11.2 percent of high school seniors reported smoking half a pack of cigarettes or more per day.

[i] Highest frequency of use included in question was 20+ times in the past month.

[j] The National Adolescent Student Health Survey used the term "psychedelics," but the actual question included what the NIDA Household Survey on Drug Abuse and other surveys refer to as hallucinogens (i.e., LSD, PCP, mescaline, peyote, psilocybin).

[k] The National PRIDE survey *did not*, and the Monitoring the Future/High School Seniors Survey *did*, distinguish between medical and nonmedical use of drugs.

[l] The National PRIDE survey used the term "downers." Reported use is included here under sedatives. The Monitoring the Future/High School Seniors Survey asked about both sedatives and tranquilizers (nonmedical use only).

[m] The National PRIDE survey used the term "uppers." It did not ask respondents to distinguish between medical and nonmedical use of drugs.

[n] This figure is for prescription amphetamines for nonmedical use.

[o] This figure is for nonprescription look-alike stimulants and pep pills sold legally in most States without a prescription, usually by mail.

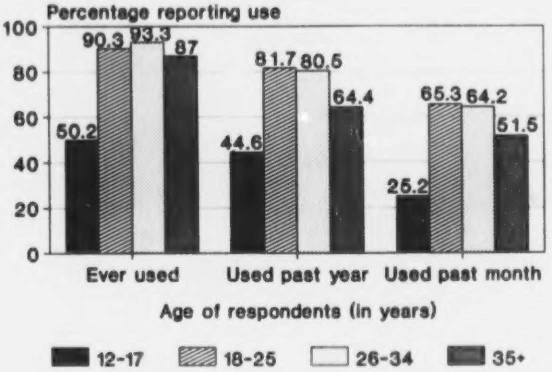
[p] This figure is for nonprescription stay-awake pills (e.g., No-Doz[R], Vivarin[R]).

SOURCE: Office of Technology Assessment, 1991, based on data from the following sources: **National PRIDE Survey:** National Parents' Resource Institute for Drug Education, *The PRIDE Questionnaire for Grades 6-12, National Database, 1988-1989* (Atlanta, GA: July 24, 1989). **Monitoring the Future/High School Seniors Survey:** U.S. Department of Health and Human Services, data from the 1989 "Monitoring the Future Survey" of drug use among high school seniors (conducted by the Institute for Social Research, University of Michigan and funded by the National Institute on Drug Abuse), *HHS News*, Feb. 13, 1990. **National Adolescent Student Health Survey:** American School Health Association, Association for the Advancement of Health Education, Inc., and Society for Public Health Education, Inc., *The National Adolescent Student Health Survey: A Report on the Health of America's Youth* (Oakland, CA: Third Party Publishing, 1989).

- About 2 percent of high school seniors reported using *LSD* in the month preceding the 1989 Monitoring the Future/High School Seniors Survey, but less than 0.5 percent reported having used LSD 20 or more times in the month prior to the survey. Almost 5 percent of high school seniors reported having used LSD at least once in the year prior to the survey.

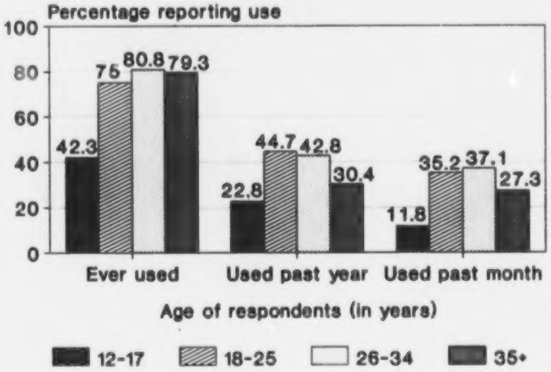
Comparison of Psychoactive Substance Use by Adolescents and Adults—There are few comparisons of adolescents' use of psychoactive substances

Figure 12-1—Use of Alcohol in the United States, by Age, 1988



SOURCE: Office of Technology Assessment, 1991, based on data from U.S. Department of Heath and Human Services, Public Health Service, Alcohol, Drug Abuse, and Mental Health Administration, National Institute on Drug Abuse, *National Household Survey on Drug Abuse: Main Findings 1988*, DHHS Pub No. (ADM) 90-1682 (Rockville, MD: 1989).

Figure 12-2—Use of Cigarettes in the United States, by Age, 1988



SOURCE: Office of Technology Assessment, 1991, based on data from U.S. Department of Heath and Human Services, Public Health Service, Alcohol, Drug Abuse, and Mental Health Administration, National Institute on Drug Abuse, *National Household Survey on Drug Abuse: Main Findings 1988*, DHHS Pub No. (ADM) 90-1682 (Rockville, MD: 1989).

with use of other age groups. Only the NIDA Household Survey on Drug Abuse collects information about substance use from a broad sample of age groups from age 12 and over.[21]

Comparing adolescent and adult drug use is complicated because of the need to take both cohort and contemporary effects into account. It is important to note that the age group 35 and over represents a very diverse group in terms of drug use experience and that an average for all those 35 and over is not a valid comparison to the 12- to 17-year-old age group.[22] Further, the number of individuals in the population ages 35 and over (112 million in 1988 [287a]) is far greater than the number of individuals in the population ages 12 to 17 (20.5 million [287a]). Because the NIDA Household Survey on Drug Abuse does not report on age groups with equivalent population distributions, comparisons of rates of drug use in widely varying age groups should be made with caution.

Data from the 1988 NIDA Household Survey on the use of alcohol, cigarettes, and illicit drugs reported by U.S. adolescents ages 12 to 17 and by individuals in older population groups are summarized in figures 12-1, 12-2, and 12-3. The substance reportedly used by the most respondents in all age groups is alcohol, followed by cigarettes. As shown in figures 12-1 and 12-2, U.S. adolescents are less likely to report having used alcohol or cigarettes than adults, whether the time frame is ever, the past year, or the past month.

The 1988 NIDA Household Survey on Drug Abuse found that smaller percentages of individuals in all age groups reported use of *any illicit drug* than reported use of alcohol or cigarettes. As shown in figure 12-3, adolescents were far less likely than young adults ages 18 to 34 and about as likely as adults age 35 and over to report ever having used any illicit drug. About 25 percent of 12- to 17-year-olds reported ever having used an illicit drug, as compared with roughly 60 percent of 18- to 34-year-olds and 23 percent of those over age 34. When asked about illicit drug use in the past month, 12- to 17-year-olds reported less use than young adults ages 18 to 34 and more use than adults 35 and older.

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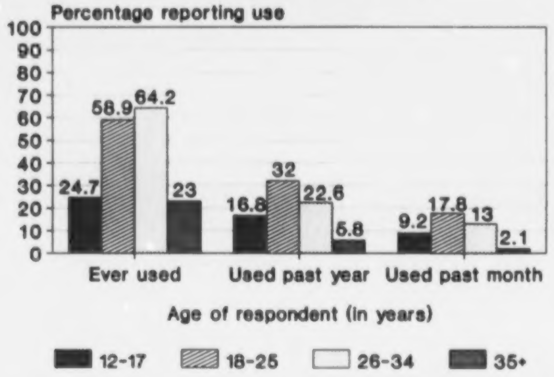
[21] In 1991, the Monitoring the Future/High School Seniors Survey reported data on a sample of 19- to 28-year-olds who had been followed up from high school for 1986 through 1990 (289).

[22] For example, 1988 DAWN data show that the distribution of *drug abuse* (as defined for the DAWN survey) associated with emergency room visits is very variable for those 30 and over, with the following distribution: ages 30 to 39, 23,615 encounters; ages 40 to 49, 6,651 encounters; ages 50 to 59, 1,380 encounters; and 60 and older, 371 encounters (302). Imputed "motives" for drug use resulting in an emergency room encounter also vary by age. For example, drug *dependence* as an inferred "motive" for drug use rose with age from ages 10 through 39, and declined with age from age 40 on (302). If 6- to 9-year-olds are not included, drug dependence as a motive was lowest among those 10 to 17 (7.8 percent) and 60 and older (16.3 percent) (302).

Figure 12-3—Use of Any Illicit Drug[a] in the United States, by Age, 1988



[a] In the NIDA Household Survey on Drug Abuse, the term "any illicit drug" is defined as marijuana, inhalants, cocaine, hallucinogens, PCP, heroin, or the nonmedical use of psychotherapeutics (i.e., prescription medications which can be used illicitly to get high or for other mental effects).

SOURCE: Office of Technology Assessment, 1991, based on data from U.S. Department of Heath and Human Services, Public Health Service, Alcohol, Drug Abuse, and Mental Health Administration, National Institute on Drug Abuse, *National Household Survey on Drug Abuse: Main Findings 1988*, DHHS Pub No. (ADM) 90-1682 (Rockville, MD: 1989).

Summary: Current Estimates of the Prevalence of Substance Use Among U.S. Adolescents Based on Self-Report Data—The majority of contemporary American adolescents report that they have tried the substances that are legally available to and widely used by adults—alcohol and cigarettes—at least once during adolescence. A substantial portion of adolescents appears to consume alcohol heavily and frequently, and 1 out of 10 smokes half a pack or more cigarettes a day. Available data from household and student surveys suggest that the illicit drug adolescents are most likely to try is marijuana, followed by stimulants, inhalants, cocaine, and hallucinogens. Few adolescents appear to use any substance—licit or illicit—daily, but those few represent a sizable minority of individuals.

Estimates of the Prevalence of Psychoactive Substance Use Resulting in Death or the Need for Emergency Medical Care

Extreme indicators of problem use of psychoactive substances are death or the need for emergency medical care from substance abuse. In 1988, 13,975 U.S. adolescents ages 10 to 17 visiting the emergency rooms participating in NIDA's DAWN system tested positive for drugs (302). DAWN is not a very useful source of information on psychoactive substance abuse by adolescents, because alcohol, the most frequently used psychoactive drug among adolescents, is mentioned only when it is used in combination with another drug. The majority (61.8 percent) of these adolescents had used drugs to attempt suicide; less than 20 percent experienced an emergency as a result of using a drug for recreational purposes (302). About 8 (7.8) percent of the 13,975 10- to 17-year-olds who tested positive for drugs did so because of drug "dependence" (302).

Consistent with other evidence on suicide, DAWN data show that female adolescent patients (black, Hispanic, and white non-Hispanic) were much more likely than male patients to have used drugs to attempt suicide,[23] while male patients (black, Hispanic, and white non-Hispanic) were more likely to report having used the drugs for recreational purposes or because they were drug dependent (302).

Few U.S. adolescents die as a result of drug use that is not accidental or associated with suicide. In 1987, 3 adolescents ages 10 to 14 and 109 adolescents ages 15 to 19 in this country died as a result of drug poisoning not related to suicide (319).[24] NIDA reports that, of the 82 drug-related deaths among 10- to 17-year-olds reported to DAWN by medical examiners, approximately 45 percent were classified as suicides (307). The apparently nonsuicidal drug poisoning mortality *rates* (per 100,000 population) for 10- to 14-year-olds and 15- to 19-year-olds did not change between 1979 and 1987 (319).

As shown in table 12-6, DAWN emergency room data by type of drug are reported for 6- to 17-year-olds in the aggregate, not for adolescents separately. Since children ages 6 to 9 accounted for only 0.5 percent (77 of the cases) on which the 1987 drug-by-drug analysis was based (302), however, most of the data pertain to adolescents. The majority of the substances used by adolescents seen in emergency rooms are licit substances like acetaminophen, alcohol in combination with other drugs, and aspirin, which together accounted for about 43 percent of the substances mentioned by emergency

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[23] Suicide and suicide attempts among U.S. adolescents are discussed in ch. 11, "Mental Health Problems: Prevention and Services," in this volume.

[24] These deaths include *International Classification of Diseases* E-Codes 980.0 to 980.5, "Death From Poisoning by Drugs, Medicaments, and Biological [not determined whether accidental or unintentional]" and E-Codes 850 to 858, "Death From Poisoning by Drugs, Medicaments, and Biologicals: Accidental" (319).

Table 12-6—DAWN Emergency Room Data on Drug Use by Patients 6 to 17 Years of Age, 1987[a]

	Drug name	Number of mentions[b]	Percentage of total episodes
1	Acetaminophen	2,137	14.80
2	Alcohol in combination with other drugs	2,084	14.44
3	Aspirin	2,057	14.25
4	Marijuana/hashish	1,311	9.08
5	Cocaine	1,153	7.99
6	Ibuprofen	942	6.52
7	PCP/PCP combinations[c]	681	4.72
8	LSD[d]	490	3.39
9	Acetaminophen/codeine	387	2.68
10	Diazepam	376	3.60
11	Theophylline	336	2.33
12	Erythromycin	271	1.88
13	Diphenhydramine	252	1.75
14	OTC sleep aids[e]	245	1.17
15	Caffeine	227	1.57
16	Amitriptyline	181	1.25
17	d-Propoxyphene	172	1.19
18	OTC diet aids[e]	168	1.16
19	Pseudoephedrine	167	1.16
20	Alprazolam	154	1.07
21	Haproxen	150	1.04
22	Imipramine	148	1.03
23	Speed	145	1.00
23	Ampicillin	145	1.00
25	Amoxicillin	141	0.98
26	Tetracycline HCl	122	0.85
27	Phenobarbital	113	0.78
28	Amphetamine	110	0.76
29	Methamphetamine	105	0.73
30	Heroin/morphine	98	0.68
30	Penicillin G potassium	98	0.68
32	Butalbital combinations	93	0.64
33	Hydantoin	91	0.63
34	Oxycodone	87	0.60
35	Carbamazepine	84	0.58
36	Codeine	83	0.57
37	Thioridazine	82	0.57
38	Pseudoephed/triprolidine	78	0.54
39	Lorazepam	76	0.53
39	Cyclobenzaprine	76	0.53
41	Triazolam	71	0.49
41	Hydroxyzine	71	0.49
43	Flurazepam	68	0.47
43	Haloperidol	68	0.47
43	Penicillin V potassium	68	0.47
46	Lithium carbonate	64	0.44
47	Phenylpro/chlorphen mal.	63	0.44
48	Propanolol HCl	62	0.43
49	Cephalexin	59	0.41
50	Doxepin	58	0.40
50	Mescaline	58	0.40
52	Trimethoprim/sulfamethox	57	0.39
53	Desipramine	53	0.37
54	Chlordiazepoxide	52	0.36
54	Phenylpro/Bromph/Phenyle	52	0.36
56	Hydrocodone	51	0.35
56	Indomethacin	51	0.35
56	Chlorpheniramine	51	0.35
59	Chlorpromazine	49	0.34
59	Trazodone	49	0.34
61	Temazepam	47	0.33
61	Triamterene	47	0.33
61	Brompheniramine maleate	47	0.33
64	Cimetidine	44	0.30
65	Amitriptyline combinations	43	0.30
66	Chlorzoxazone/acetaminophen	41	0.28
66	Atrop/Scopo/Hyoscy/Pheno	41	0.28
68	Nortriptyline	40	0.28
68	Methocarbamol	40	0.28
70	Methylphenidate	38	0.26
71	Guaifenesin	37	0.26
72	Benzodiazepine (residual)	36	0.25
72	Carisoprodol	36	0.25
72	Phenylephr/chlorphen mal.	36	0.25
75	Clorazepate	35	0.24
75	Dicyclomine	35	0.24
77	Metoprolol	34	0.24
77	Doxycycline	34	0.24
79	Phenylpropanola/acetaminophen	33	0.23
80	Furosemide	32	0.22
81	Metronidazole	31	0.21
82	Hydrochlorothiazide	30	0.21
82	Metaproterenol sulf.	30	0.21
84	Methadone	29	0.20
85	Ferrous sulfate	28	0.19
86	Glues	28	0.19
87	Phenylpropanolamine	26	0.18
88	Meprobamate	25	0.17
88	Sulindac	25	0.17
88	Diphenoxylate/atropine	25	0.17
91	Benztropine	24	0.17
91	Aspirin/codeine	25	0.17
93	Prednisone	23	0.16
93	Fenoprofen calcium	23	0.16
93	Dimenhydrinate	23	0.16
96	Meperidine HCl	22	0.15
96	Prochlorperazine	22	0.15
98	Trifluoperazine	20	0.14
98	Butabarbital combination	20	0.14
98	Norgesic	20	0.14
98	Valproic acid	20	0.14

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[a] The data in this table are from the Drug Abuse Warning Network (DAWN) of the National Institute on Drug Abuse within the U.S. Department of Health and Human Services.

[b] Data are based on raw frequencies of drug mentions and a total raw emergency room episode count of 14,437 for patients 6 to 17 years of age. In using this table, the reader should be aware that individual drugs are frequently mentioned in combination with other drugs and that the population at risk of an adverse consequence relating to the abuse of any particular drug is unknown, i.e., the number of people abusing a particular substance, either alone or in any combination, is unknown. Thus the relative frequency of mentions of any drug pertains only to the DAWN system and not the larger population at risk.

[c] PCP refers to phencyclidine.

[d] LSD refers to lysergic acid diethylamide.

[e] OTC drugs are drugs sold "over the counter," i.e., without a prescription.

SOURCE: U.S. Department of Health and Human Services, Public Health Service, Alcohol, Drug Abuse, and Mental Health Administration, National Institute on Drug Abuse, *Data From the Drug Abuse Warning Network DAWN: Annual Data 1987*, DHHS Pub. No. (ADM) 88-1584 (Rockville, MD: 1988).

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Table 12-7—Arrest Rates for Drug Abuse Violations in the United States, by Age and Sex, 1965-88[a]

	Number of arrests for drug abuse violations per 100,000 population					
	Under age 18			Age 18 and over		
Year	Total	Male	Female	Total	Male	Female
1965	11.7	20.2	2.9	50.4	90.7	13.2
1966	18.9	31.7	5.5	62.8	113.1	16.8
1967	44.6	73.5	14.6	91.5	166.5	23.4
1968	91.2	145.0	35.4	135.1	246.1	34.6
1969	122.4	189.9	52.4	199.1	361.6	52.2
1970	160.3	244.7	72.7	285.3	516.6	76.0
1971	177.1	271.3	79.2	319.4	575.1	87.6
1972	190.7	300.9	76.1	320.4	577.8	86.3
1973	263.2	423.2	96.7	355.6	648.9	88.9
1974	305.7	496.4	107.2	398.6	727.4	99.6
1975	245.0	401.0	82.7	339.9	621.9	83.6
1976	242.8	398.5	80.7	342.0	624.0	85.7
1977	237.2	388.6	79.4	334.1	608.0	85.1
1978	242.4	396.0	82.2	321.0	587.9	78.6
1979	202.3	330.9	67.9	289.3	530.7	69.9
1980	184.7	301.5	62.7	306.9	565.8	74.7
1981	173.6	285.1	56.9	332.8	610.5	80.2
1982	150.1	246.2	49.7	358.0	651.8	90.5
1983	135.4	222.0	44.9	370.2	670.2	96.8
1984	139.2	231.3	42.7	380.9	690.0	99.4
1985	153.1	255.4	45.8	423.3	766.1	110.0
1986	135.5	227.6	39.0	440.3	789.2	121.0
1987	143.9	244.3	38.6	491.6	872.6	142.6
1988	158.3	271.0	40.0	552.6	973.7	166.5

[a] The Federal Bureau of Investigation's Uniform Crime Reports defines *drug abuse violations* as State and local offenses related to the unlawful possession, sale, use, growing, and manufacturing of narcotic drugs (323).

SOURCE: U.S. Department of Justice, Federal Bureau of Investigation, *Age-Specific Arrest Rates and Race-Specific Arrest Rates for Selected Offenses 1965-1988* (Washington, DC: April 1990).

rooms as being used by 6- to 17-year-olds. Unfortunately, it is not possible to pair these substances with the motive or reason for the emergency room visit in this age group (301).

Arrests as an Indicator of Psychoactive Substance Use and Substance Use Problems

In general, sources of data on arrests related to drug abuse violations by U.S. adolescents have tracked declines in use. Arrests related to alcohol use have shown a more complicated pattern (182).

Arrests Related to Illicit Drugs—Arrest rates for drug abuse violations among individuals under age 18 rose somewhat steadily between 1965 and 1974, when they began to decline (see table 12-7). Another increase in arrest rates for drug abuse violations occurred in 1985, a year when the use of cocaine increased among high school seniors.[25] Somewhat anomalously, arrest rates for drug abuse violations among individuals under age 18 increased in 1988, despite the fact that drug use was down.

Arrests Related to Alcohol—Federal Bureau of Investigation Part II offenses[26] related to the drinking of alcohol are categorized three different ways:

- driving under the influence,
- drunkenness (excluding driving under the influence), and
- State and local liquor law violations.

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[25] As noted above, drug use among high school seniors is often taken as an indicator of drug use among all adolescents. DHHS plans to collect information on substance use from a broader range of adolescents (including nonstudents) in the future (326,327).

[26] See ch. 13, "Delinquency: Prevention and Services," in this volume for explanation of different types of offenses.

Menard analyzed differences in arrests of adolescents for drunkenness and liquor law violations between 1976 and 1987 for OTA (182). While arrests for drunkenness declined from 1.36 to 0.69 per 1,000 11- to 17-year-olds between 1976 and 1987, arrests for liquor law violations rose from 3.74 to 4.55 per 1,000 11- to 17-year-olds. Menard suggested that these differences may reflect recent decreases in the availability of alcohol to minors (182).[27]

Demographic Differences in Psychoactive Substance Use by Adolescents

Racial and Ethnic Differences in Substance Use—While a popular assumption may be that substance use is most prevalent among black adolescents in the United States, self-report data from recent NIDA Household Surveys on Drug Abuse indicate that black adolescents ages 12 to 17 are *less* likely than adolescents from any other racial or ethnic groups to report the use of any illicit drug—whether the measure is lifetime, annual, or past-30-days use (303). NIDA Household Survey on Drug Abuse data indicate that Hispanic adolescents are slightly less likely than non-Hispanic white adolescents (but more likely than black adolescents) to use illicit drugs. In the case of cocaine and crack cocaine, however, Hispanic adolescents report slightly more use than non-Hispanic white adolescents. Hispanic adolescents are also less likely than non-Hispanic white adolescents (but more likely than black adolescents) to report use of alcohol, cigarettes, and smokeless tobacco.

The NIDA Household Survey on Drug Abuse and the Monitoring the Future/High School Seniors Survey involve different populations (adolescents in households, high school seniors), but both are limited by having only small annual samples of adolescents in racial and ethnic minority groups. Bachman and his colleagues performed an analysis that sought to compensate for the Monitoring the Future/High School Seniors Survey's small annual sample sizes by combining data from 1976 through 1989 into three groups (1976-79, 1980-84, and 1985-89) (15). This analysis provided somewhat more information than the NIDA Household Surveys on Drug Abuse, because it allowed information on Native American and Asian American high school seniors, in addition to that for white, black, and Hispanic high school seniors, to be disaggregated. Bachman and his colleagues found results from the Monitoring the Future/High School Seniors Survey that were generally similar to those of the NIDA Household Surveys (15). Native American high school seniors had the highest prevalence rates for the use of cigarettes, alcohol, and most illicit drugs. White non-Hispanic high school seniors had the next highest prevalence rates for the use of most drugs; Hispanic high school seniors had the next highest prevalence rates (except for relatively high cocaine use among Hispanic males) (15). Asian American and black high school seniors had the lowest prevalence rates (15).

It may be important to note that NIDA and other self-report data on racial and ethnic differences in substance use by adolescents do not appear to be consistent with differences indicated by DAWN data or arrest rates for drug abuse violations (182,301, 303,306,322).[28] For example, black adolescents accounted for 20 percent, Hispanic adolescents accounted for 12 percent, and white non-Hispanic adolescents accounted for 55 percent of the DAWN episodes among 10- to 17-year-olds in 1988 (302). Arrests for drug abuse violations are disproportionately high among black adolescents (182).

Social Class and Income Differences in Substance Use—Only limited information is available about social class and income differences in psychoactive substance use by adolescents. In this chapter, social class refers to the socioeconomic status of adolescents' families of origin (most adolescents live with their families), and income refers to the adolescents' own income. These indicators may or may not be related. Both measures may be relevant to explaining adolescents' use of substances because both may make substances more available to an adolescent, but not necessarily in the same ways.

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[27] Of course, alcohol was not legally available to minors under age 18 in 1976, but presumably laws restricting alcohol to those ages 21 and over had an impact on its availability to those under age 18 as well.

[28] Discrepancies between self-report data and arrest data are a topic addressed in ch. 13, "Delinquency: Prevention and Services," in this volume.

Further, the effect of income and social class may differ for different substances. For example, since crack is less expensive than powder cocaine, crack may be more likely to be available to low-income adolescents and powder cocaine to middle- and high-income adolescents.

Very little research has examined the relationship between substance use and income among adolescents, perhaps because adolescents do not typically have a regular substantial income (176). Current population-based surveys of self-reported substance use by adolescents cannot be used to disaggregate use by socioeconomic status. For example, the Monitoring the Future/High School Seniors Survey reports data by sex, college plans, region, and population density, but not by socioeconomic status (289). Similarly, the DAWN form does not require information related to income level to be reported (302).

Elliott and his colleagues analyzed data from the National Youth Survey[29] (a survey conducted on the same cohort of adolescents from 1976 to the present) and found that in 3 of the 4 years of their study, working class adolescents[30] were no more likely to use drugs than middle class adolescents (81,83).

Several other studies that have examined the availability of spending money and the use of psychoactive substances by adolescents have found that having disposable income is positively related to substance use (190). Maddahian, Newcomb, and Bentler also found that alcohol and cigarette use increased with greater earned income; money from allowances and other given income was related to nontherapeutic use of prescription drugs—but no relationship between income and other drugs was demonstrated (176). In another analysis, Maddahian, Newcomb, and Bentler found that earned income was a significant predictor of cigarette smoking and alcohol consumption (assuming equal availability), but availability (measured as friends having given the respondent the substance and perceived ease of acquisition) "drastically" decreased the effects of earned income (and ethnicity) (175).

Age Differences in Substance Use—The detection of age differences in adolescent substance use is made difficult by the scarcity of national data on younger adolescents. Data such as those from the NIDA Household Survey on Drug Abuse that average information from a relatively wide range of adolescent ages should be interpreted with caution (306). Most available data do suggest that the tendency to use drugs, except for inhalants, generally increases with age (table 12-1, table 12-2, table 12-5). Inhalants (e.g., gasoline, airplane glue) may be easier for young adolescents to obtain and use.

As it is with other problem behaviors, the age at which an adolescent begins to use substances may be an important indicator of the likely occurrence of problem or continued use. Hirschi and Gottfredson point out a very straightforward interpretation for this pattern: at ages when very few people have a given behavior, its appearance will be concentrated among those people who are most strongly disposed to that behavior (129). In other words, if 85 percent of high school seniors and 10 percent of seventh graders consume alcohol on a regular basis, then the fact that an individual consumes alcohol says more about a person who is a seventh grader than about a person who is a high school senior.

Several analyses have found that the earlier the use of psychoactive substances, the more likely it is to result in problem use (235,272). These studies have differed, however, in what they mean by "early" use—for example, one study considers use either before 15 or before 18 early (235), while another study considers use before age 12 early (272). Furthermore, it may be important to view findings about early use in terms of cohort effects. In recent years, substance use by Americans has been occurring earlier in life. In 1975, 47 percent of the high school seniors who reported smoking cigarettes daily reported that they had begun smoking before the 10th grade, but by 1984, the figure had risen to

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[29] The National Youth Survey used a probability sample of households in the continental United States. The 1976 sample included adolescents ages 11 to 17; participants were found to be representative of the total 11- to 17-year-old population in the United States at that time as established by the U.S. Census Bureau (81,83).

[30] Working class adolescents were those whose parents were owners of small businesses, clerical workers, and persons in sales or skilled manual occupations with high school or some college completed; middle class adolescents were those whose principal wage-earning parent was in a professional or managerial occupation with a college education; and those whose parents were in semiskilled and unskilled manual occupations and had a high school or lower level of education were designated lower class.

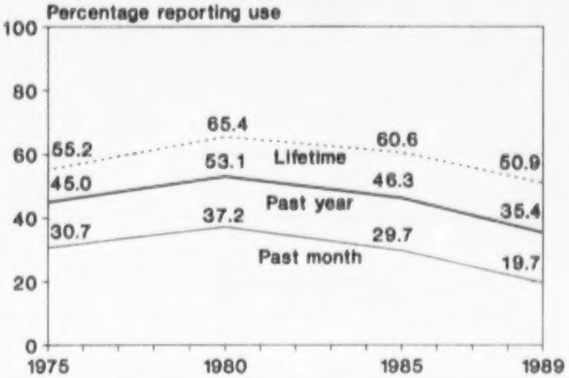
63 percent (145). What was "early onset" in one decade may become the norm in another. Nevertheless, the age of an adolescent or preadolescent's initial use of alcohol or other drugs may be a predictor of future problem use.

Recent Trends in the Use of Psychoactive Substances by U.S. Adolescents

Few data are available on trends in the use of psychoactive substances by U.S. adolescents. As noted earlier in this chapter, the NIDA Household Survey on Drug Abuse has been conducted since 1971 (303).[31] The Monitoring the Future/High School Seniors Survey has been conducted by the University of Michigan's Institute for Social Research every year since 1975 (288). Other surveys, including the National Adolescent School Health Survey and the National PRIDE Survey, have been conducted on a one-time only basis (5,206). Recently, CDC within the Public Health Service of DHHS has begun to support the regular collection of data on drug use and other behavioral risk factors from students (316), but trend data are not yet available from those surveys.

The Monitoring the Future/High School Seniors Survey shows a net decline since 1975 in the lifetime, annual, and current use[32] by U.S. adolescents of *any illicit drug* (see figure 12-4, table 12-8). Although the Monitoring the Future/High School Seniors Survey found that the lifetime, annual, and current use of any illicit drug reported by U.S. high school seniors rose somewhat in the late 1970s, these indicators declined quite steadily (except for an increase in 1985) throughout the 1980s to rates lower than those found in 1975 (300). The Monitoring the Future/High School Seniors Survey found that lifetime, annual, and current *cocaine* use by U.S. high school seniors increased between 1975 and 1979, then again between 1983 and 1985, and has steadily declined since then to approximately the 1975 levels (see figure 12-5).

Figure 12-4—Use of Any Illicit Drug[a] by U.S. High School Seniors, 1975-89



[a] In the Monitoring the Future/High School Seniors Survey, the term "any illicit drug" is defined as marijuana, cocaine, heroin, or any use which is not under a doctor's orders of other opiates, stimulants, sedatives, or tranquilizers.

SOURCE: U.S. Department of Health and Human Services, data from the 1989 "Monitoring the Future Survey" of drug abuse among U.S. high school seniors (conducted by the Institute for Social Research, University of Michigan, and funded by the National Institute on Drug Abuse), *HHS News*, Feb. 13, 1990.

The Monitoring the Future/High School Seniors Survey found that U.S. high school seniors' *daily use of marijuana, alcohol, and cigarettes* declined between 1975 and 1989 (see table 12-8). In 1975, for example, 6 percent of the high school seniors surveyed reported daily use of marijuana, and the number rose until 1982. Beginning with the class of 1983, daily use of marijuana fell slightly, until a slight (but not statistically significant) increase among the class of 1989. The only statistically significant difference between the classes of 1988 and 1989 was an increase of 0.2 percent in daily use of hallucinogens to 0.3 percent of respondents (about the same as it was in 1985 and 1986).[33]

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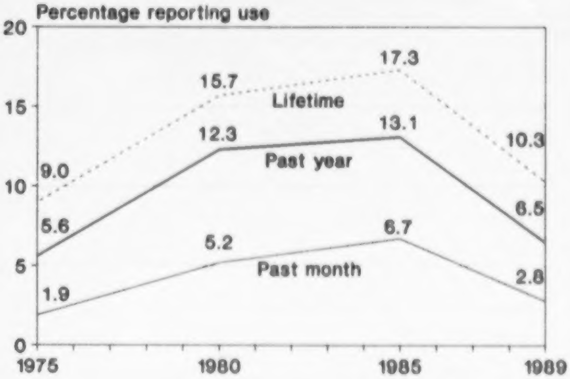
[31] According to the Office of National Drug Control Strategy (ONDCS), the NIDA National Household Survey on Drug Abuse was to be conducted annually beginning in 1990 (327).

[32] Current use in this context means use within the past month.

[33] Results of the 1990 High School Seniors/Monitoring the Future Survey (289) were reported too late to be included in detail in this Report. Nonetheless, the findings of the 1990 survey, like those of the 1990 NIDA National Household Survey on Drug Abuse, were encouraging. The 1990 survey of high school seniors found that 47.9 percent of high school seniors had used an illicit drug at least once in their lives (289). It found statistically significant declines between rates of use in 1989 and 1990 in *lifetime prevalence (ever used)* for any illicit drug, any illicit drug other than marijuana, amyl and butyl nitrites, crack, stimulants, and sedatives; *annual prevalence (use in the last year)* for any illicit drug, any illicit drug other than marijuana, marijuana/hashish, inhalants, PCP, cocaine, crack, stimulants, sedatives, and alcohol; for *use in the last 30 days* for illicit drug, any illicit drug other than marijuana, marijuana/hashish, inhalants, PCP, cocaine, crack, methaqualone, and alcohol; and for *daily use* of marijuana/hashish, cocaine, and crack (289). Of 20 types of drugs selected for analysis by NIDA, only one (inhalants) showed a statistically significant increase in use in the last year (i.e., use of *inhalants* in the last year [before adjustment] increased 1 percent).

Figure 12-5—Use of Cocaine by U.S. High School Seniors, 1975-89



SOURCE: U.S. Department of Health and Human Services, data from the 1989 "Monitoring the Future Survey" of drug abuse among U.S. high school seniors (conducted by the Institute for Social Research, University of Michigan, and funded by the National Institute on Drug Abuse), *HHS News*, Feb. 13, 1990.

Comparisons of NIDA Household Survey on Drug Abuse results over the most recent 10-year period show results consistent with the Monitoring the Future/High School Seniors Survey. Average use by 12- to 17-year-olds of almost all drugs *at least once in the last year* (so-called annual prevalence) declined between 1979 and 1988 (303).[34]

Summary of Data on the Use of Psychoactive Substances by U.S. Adolescents

Self-report data indicate that most contemporary U.S. adolescents are likely to try alcohol at least once during their adolescence, and the majority are likely to try tobacco. A significant minority of adolescents are likely to try some illicit drug (most commonly marijuana). Some of the adolescents who try psychoactive substances go on to use them regularly or in large quantities. Alcohol and tobacco are the psychoactive substances that are most likely to be used regularly or in large quantities by U.S. adolescents (e.g., one-third of adolescent respondents to recent student surveys say they have had five or more drinks on at least one occasion in the previous 2 weeks). In recent years, the use of most illicit drugs has declined considerably among U.S. adolescents (as it has among individuals in other age groups). National self-report data suggest that only a small percentage (between 0.3 and 3 percent) of today's U.S. adolescents use some illicit drug (e.g., cocaine, PCP, or marijuana) on a daily basis.

In general, white adolescents and adolescents with income (to whom substances are available) are most likely to report use of both illicit and licit substances, although there are differences by substance. Older adolescents are more likely to use psychoactive substances than younger ones, but a substantial number of very young adolescents do appear to be using substances such as alcohol, cigarettes, and inhalants. Unfortunately, few data have been collected on adolescents younger than 12; even the numbers of adolescents 12 and above who are surveyed regularly are quite small. There appear to be substantial regional variations in drug use by adolescents.

Factors Associated With Psychoactive Substance Use and Abuse by Adolescents

As discussed below, many American adolescents use alcohol, tobacco, or some other psychoactive substance at least once, but not all of these adolescents go on to use these substances heavily or frequently. Efforts to understand the psychological and social factors that lead adolescents to use psychoactive substances are fairly recent. Unfortunately, the fruits of these efforts are often difficult to interpret because of methodological limitations and differences among studies.

Methodological Issues

Studies of risk and protective factors in adolescent drug use exhibit methodological limitations and differences such as the lack of a uniform definition of the outcome variable (e.g., initiation of drug use, occasional use, frequent but low-quantity use, and chronic, heavy use); reliance on self-report data without biochemical validation; the use of cross-sectional surveys that cannot establish causality; the use of questionnaires that have not been validated or standardized for use with adolescents; and little

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[34] In 1990, NIDA conducted another National Household Survey on Drug Abuse (306), but the findings of the 1990 survey were not published in time to be included in detail in this Report. DHHS reports that the 1990 Household Survey on Drug Abuse generally found that recent declines in drug use among adolescents continued in 1990. The estimated number of U.S. adolescents ages 12 to 17 who reported ever having used any illicit drugs fell 13 percent between 1988 and 1990, from 1.866 million to 1.622 million (306).

Table 12-8--Trends in the 30-Day Prevalence of Daily Use of 18 Types of Drugs Among U.S. High School Seniors, 1975-89

	Percentage who used daily in last 30 days									
Drugs Approx. no =	Class of 1975 (9,400)	Class of 1977 (17,100)	Class of 1979 (15,500)	Class of 1981 (17,500)	Class of 1983 (16,300)	Class of 1985 (16,000)	Class of 1987 (16,300)	Class of 1988 (16,300)	Class of 1989 (16,700)	1988-89 % change
Marijuana/hashish	6.0	9.1	10.3	7.0	5.5	4.9	3.3	2.7	2.9	+0.2
Inhalants[a]	NA	0.0	0.0	0.1	0.1	0.2	0.1	0.2	0.2	0.0
Inhalants adjusted[b]	NA	NA	0.1	0.2	0.2	0.4	0.4	0.3	0.3	0.0
Amyl and butyl nitrites[c d]	NA	NA	0.0	0.1	0.2	0.3	0.3	0.1	0.3	+0.2
Hallucinogens	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0[j]
Hallucinogens adjusted[e]	NA	NA	0.2	0.1	0.2	0.3	0.2	0.0	0.3	+0.2[i j]
LSD	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0
PCP[c d]	NA	NA	0.1	0.1	0.1	0.3	0.3	0.1	0.2	+0.1
Cocaine	0.1	0.1	0.2	0.3	0.2	0.4	0.3	0.2	0.3	+0.1
Crack cocaine[f]	NA	NA	NA	NA	NA	NA	0.1	0.1	0.2	+0.1
Other cocaine[g]	NA	NA	NA	NA	NA	NA	0.2	0.2	0.1	-0.1
Heroin	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	+0.1
Other opiates[g]	0.1	0.2	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.0[j]
Stimulants[g]	0.5	0.5	0.6	1.2	1.1	NA	NA	NA	NA	NA
Stimulants adjusted[g h]	NA	NA	NA	NA	0.8	0.4	0.3	0.3	0.3	0.0
Sedatives[g]	0.3	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	+0.1[i]
Barbiturates[b]	0.1	0.2	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.0[j]
Methaqualone[g]	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0[j]
Tranquilizers[g]	0.1	0.3	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.0[j]
Alcohol										
Daily	5.7	6.1	6.9	6.0	5.5	5.0	4.8	4.2	4.2	0.0
Five or more drinks in a row in the last 2 weeks	36.8	39.4	41.2	41.4	40.8	36.7	37.5	34.7	33.0	-1.7
Cigarettes										
Daily	26.9	28.8	25.4	20.3	21.2	19.5	18.7	18.1	18.9	+0.8
Half-pack or more per day	17.9	19.4	16.5	13.5	13.8	12.5	11.4	10.6	11.2	+0.6

KEY: NA = not available.

NOTE:

[a] Data are based on four questionnaire forms in 1976-1988; the number of respondents to this item (n) is four-fifths of the total sample size indicated at the top of the column (N). Data are based on five questionnaire forms in 1989; n is five-sixths of N indicated.

[b] Figures are adjusted for underreporting of amyl and butyl nitrite.

[c] Data are based on a single questionnaire form; n is one-fifth of N indicated in 1979-1988 and one-sixth of N indicated in 1989.

[d] Question text changed slightly in 1987.

[e] Figures are adjusted for underreporting of PCP.

[f] Data are based on two questionnaire forms; n is two-fifths of N indicated in 1987-1988 and two-sixths of N indicated in 1989.

[g] Only drug use which was not under a doctor's orders is included here.

[h] Figures are based on the data from the revised question, which attempts to exclude the inappropriate reporting of nonprescription stimulants.

[i] Any apparent inconsistency between the change estimate and the prevalence estimates for the two most recent classes is due to rounding error.

[j] Difference is statistically significant ($p<.01$).

SOURCE: U.S. Department of Health and Human Services, data from the 1989 "Monitoring the Future Survey" of drug abuse among U.S. high school seniors (conducted by the Institute for Social Research, University of Michigan, and funded by the National Institute on Drug Abuse), *HHS News*, Feb. 13, 1990.

attempt to correct for confounding effects (189).[35] Furthermore, because different drugs have different effects on the body, it is important to understand whether there are specific risk factors for individual drugs. Unfortunately, much of the research that has been conducted with adolescents does not allow such a fine-grained analysis. Drug use is often approached globally, and heavy users and those for whom drug use is causing a problem typically are not separated from those who use substances less frequently. Because alcohol is the most frequently used drug, analyses that combine drug use of all kinds are unlikely to be informative about the risk factors for use of specific drugs. While there is considerable evidence that adolescents who use one substance are also likely to use another, use of any one substance does not inevitably mean that other substances are being used (216).[36]

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[35] In addition, psychoactive substances of choice among users may change over time. When such changes occur, research normally lags behind the new use patterns. For example, the body of existing research literature is relatively rich with studies of drugs that have been in use in American culture for a considerable period of time (e.g., alcohol, tobacco, marijuana), while studies of the newer psychoactive substances such as ''crack'' or ''ice'' are uncommon.

Several factors that are believed to lead to drug use among adolescents have been investigated more thoroughly than others. The more heavily researched factors include having a substance-abusing parent (163), other parental behavior as discussed under "family factors" below (25,26), associating with substance-using peers (189), and unconventionality (139,140). Most recently, considerable attention has been devoted to research on possible biological factors in addiction. The most interesting and valuable studies have investigated the influence of a variety of factors using a longitudinal design (e.g., 208). However, even the longitudinal studies are limited because they have relied on adolescents' self-reports and have not examined biological propensities to addiction. Further, even the most advanced statistical methods are limited in the number of factors they can analyze simultaneously.

Much less research has been conducted on the impact of specific drugs themselves and on the impact of school, work, and other broader societal environments on adolescents' use of psychoactive substances. A 1990 report by OSAP in DHHS recently listed 65 "widely identified" risk factors and 39 "widely identified" protective factors for adolescent drug abuse (312). A previous OSAP report summarized many of the most widely identified risk factors in a figure (see figure 12-6).[37]

This section reviews evidence on the following risk and factors for substance use in general: family factors; factors related to peers; personal characteristics of adolescent substance users; school, work, and societal impacts; and appetitive drug effects. Then it reviews some of the evidence for factors associated with adolescents' use of the specific substances tobacco/cigarettes and alcohol. Readers are advised that research into risk factors for adolescent drug use and abuse is deservedly a rapidly growing field (312). Good evidence on risk factors is needed for the design of effective preventive interventions.

Family Factors Associated With Psychoactive Substance Use by Adolescents

Any examination of the influence of family (or any other social variable) on adolescent substance use must recognize that the factors under consideration usually are not determinative. Adolescents who, to all outward appearances, are at "high-risk" of becoming psychoactive substance users may never use such substances, while others theoretically isolated from significant "risks" may indulge heavily. Researchers are examining this phenomenon, which has been variously termed "invulnerability" or "resiliency," in an effort to identify protective factors which help to immunize an individual against the risk of a negative life outcome (171,178,239,333).

Substance-Abusing Parents—Most of the research on having substance-abusing parents as a risk factor for adolescent drug use has focused on children of alcoholic parents and may not always be generalizable to parents who use other drugs. Still it appears that children of substance-abusing parents are more likely than other children to use psychoactive substances (163,285). Whether this finding reflects inherited biological factors or factors related to living with substance-abusing parents is an unresolved issue (100,163).

In a recent review for NIDA, Kumpfer drew the following conclusion:

> Biomedical research in this area [children of substance abusers] is still in its infancy, and the few existing studies need additional replication; but a consistent picture is beginning to emerge of 1) differences in metabolism and reaction to alcohol and other drugs, 2) predisposing temperament and psychological characteristics, 3) neurological and biochemical differences, and 4) psychological and cognitive differences that could make a child more vulnerable to substance abuse (163).

The strongest evidence of biological vulnerability has come from research on alcoholic fathers and

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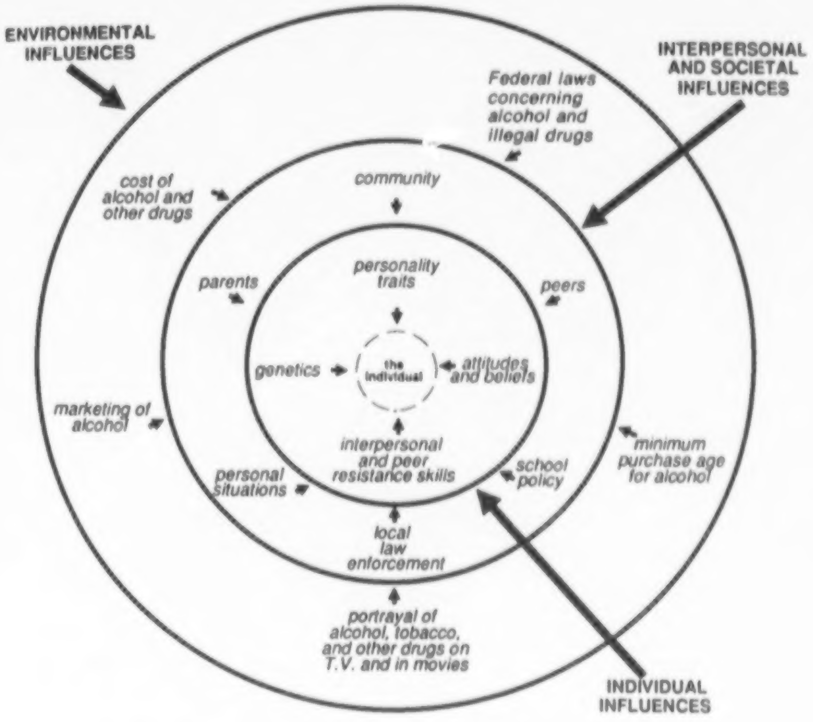
[36] In a review of the literature on covariation in adolescents' use of various substances, Osgood and Wilson found correlation coefficients ranging from 0.30 to 0.68 (216).

[37] The terms used in the 1990 OSAP report (312) were somewhat different from those in the earlier OSAP report (310), although they can be made to correspond. The 1990 OSAP report used the terms ecological environment (e.g., poverty, living in an economically depressed area with high unemployment); family environment; constitutional vulnerability/strengths of the child; early behavior problems/personality of the child; adolescent problems (e.g., school failure and dropout); and negative adolescent behavior and experiences (e.g., resistance to authority, strong need for independence, hopelessness, vulnerability to peer pressure) (312).

[38] Kumpfer notes there is some, but not much, research on heroin-abusing mothers and their children (163).

Figure 12-6—Factors That May Influence Alcohol, Tobacco, and Other Drug Use by Adolescents


ENVIRONMENTAL INFLUENCES
INTERPERSONAL AND SOCIETAL INFLUENCES
Federal laws concerning alcohol and illegal drugs
cost of alcohol and other drugs
community
personality traits
parents
peers
genetics
the individual
attitudes and beliefs
marketing of alcohol
interpersonal and peer resistance skills
minimum purchase age for alcohol
personal situations
school policy
local law enforcement
portrayal of alcohol, tobacco, and other drugs on T.V. and in movies
INDIVIDUAL INFLUENCES

SOURCE: U.S. Department of Health and Human Services, Public Health Service, Alcohol, Drug Abuse, and Mental Health Administration, Office for Substance Abuse Prevention, *Prevention Plus II*, DHHS Pub. No. (ADM) 89-1649 (Rockville, MD: 1989).

their sons.[38] Recent research on the effects of serotonin uptake inhibitors (fluoxetine and fluvoxamine) and norepinephrine uptake inhibitors (desipramine) on alcohol and food intake suggest that problem alcohol users (and overeaters) may be self-medicating for neurotransmitter deficiencies (163). Whether these neurotransmitter deficiencies are inherited is unknown.[39]

Existing research on the *behavior* of substance-using parents is scanty and not systematic (163). Nevertheless, the work that has been done suggests that such a parent is typically self-involved and lacking in parenting and family management skills. The lack of parental supervision and training in appropriate behavior often results in poor home and school behaviors (temper tantrums, crying, aggression, sadistic behaviors, lying, screaming, noncompliance, absence from school, lateness) and social isolation (163). Such children may be more vulnerable to the use of substances to self-medicate. This chain of events is more likely to occur if the child has special needs that may occur as a result of substance use during pregnancy or inherited biochemical deficiencies (163). In addition to being more vulnerable to deficits that may lead them to abuse substances, children of substance users are more likely to be directly exposed to substances and even to be encouraged or permitted by their parents to use substances (25).

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[39] A complete review of the evidence for biological issues in psychoactive substance use and abuse among adolescents is beyond the scope of this Report.

Other Parental Behavior Associated With Substance Abuse Among Adolescents—A recently completed longitudinal study of children and their parents by Baumrind demonstrates the impact of parents on psychoactive substance use and abuse (26). Baumrind's study is impressive for its method and intensiveness: experienced psychologists made comprehensive ratings of both child and parent when the children were ages 4, 9, and 15. In addition, Baumrind examined different levels of substance use and assessed the relationships between substance use and other adolescent behaviors, both desirable and undesirable.[40]

Baumrind found that a variety of family types protected their adolescents from problem use of substances, but in different ways and with different consequences. Her findings included the following:

- "Authoritative" (but not authoritarian) families, in which parents are firm and committed but also embrace some nontraditional beliefs, were able to protect their adolescents from problem drug use *and* generate competence.[41]
- Children from "democratic" homes, in which parents value freedom highly, were as competent as children from authoritative families during adolescence, but more (not all) of the children from democratic homes were heavy users of marijuana or alcohol.
- Children from directive homes, in which parents are considerate and supportive and value control highly, avoided drugs altogether but were not as competent as the adolescents from democratic and authoritative homes.

Unlike adolescents who *experimented* with psychoactive substances, Baumrind found that adolescents whose drug use indicated *dependence* had come from families that were quite dysfunctional (26). Similarly, a study by Newcomb and Bentler suggested that there were relationships between family disruption in year 1 (junior high school), lack of social conformity in year 5 (high school), and problem drug use in year 9 (early twenties) (208).[42]

Peer-Related Factors Associated With Psychoactive Substance Use by Adolescents

Use of drugs by peers has been the most consistent factor associated with adolescents' use of substances (189). Robinson and his colleagues found, for example, that perceptions of friends' use of marijuana (the only substance chosen for inclusion in the analysis) accounted for 41 percent of the total variance in a group of 10th graders' use of various substances (including tobacco, alcohol, marijuana, cocaine, LSD, and heroin) (237). However, findings of peer influence are typically confounded by researchers' use of cross-sectional research designs. In other words, at least some of the adolescents who use drugs may be choosing peers who also use drugs.

The importance of a longitudinal research design is shown in Stein, Newcomb, and Bentler's analysis of data collected over an 8-year period beginning when respondents were in junior high school (261). Analyses done *within* any particular year supported the findings of previous research on the importance of peer influences on adolescent substance use. In analyses of substance use done *across time*, however, only prior drug use and lack of social conformity[43] were found to be significantly related to adolescents' drug use. Among junior high school students, for example, the less the social conformity of the young adolescents, the more likely they were to think that their peers and adults they knew were using drugs or alcohol and that the community they lived in approved of drug use.

Stein, Newcomb, and Bentler, in contrast to Robinson and colleagues, examined the differential impact of adolescents' perceptions about adult and peer use of different drugs (261). The study found that adolescents' perceptions of adult drug use generally exerted an influence on their own alcohol use, and perceptions of peer drug use exerted an influence on their marijuana and other drug use. Unfortunately, Stein, Newcomb, and Bentler did not take into account the difference between use and problem use until year 9 of their study, when respondents were in the their early twenties. Nevertheless, they did find a statistically significant relationship between disruptive drug use in year 9 (defined as drinking or using drugs at school or at work) and any drug use in year 5. Stein, Newcomb, and Bentler's work is limited by their reliance on respondent self-reports, but the study's use of a longitudinal design and its interactionist perspective make it a model for future research.

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[40] However, Baumrind's work was limited to an essentially white middle-class population and the findings may not apply to families from other ethnic, racial, or economic backgrounds.

[41] For further discussion of authoritative parenting and other family types, see ch. 3, "Parents and Families' Influence on Adolescent Health," in this volume.

[42] The potential impact of family disruption (measured as whether the parents were married to each other) was not measured until year 5 of the study. However, in their model, the researchers include family disruption as a variable present in year 1, apparently because they assume that if the parents were not married to each other in year 5, disruption was present in year 1. This may be a reasonable assumption, but it was not tested empirically in the study.

[43] Social conformity was measured by obedience to law, conservatism, and religious commitment (261).

Personal Characteristics of Adolescent Substance Users

Is there a type of adolescent who is more likely to become a substance user? While adolescent substance use cuts across age, gender, racial, ethnic, and geographic lines, some intriguing research has explored the possibility that there may be clusters of personality traits and ways in which some adolescents perceive their environments that indicate a heightened risk of problem use of psychoactive substances, as well as other ''problem behaviors.''

Starting from the premise that certain behaviors (including marijuana use, problem drinking, and cigarette smoking) are problem behaviors, Jessor and colleagues have developed a theory to account for such behaviors among adolescents (139,140).[44] In their model, personality factors combine with an adolescent's view of peers and adults to predict problem behaviors. The personality factors may be a function of antecedent or background variables (142). In testing problem behavior theory, Jessor and his colleagues have found that adolescents who are more likely to use marijuana or become involved with drinking place a high value on being critical of society, a low value on academic achievement, and a high value on independence; tolerate deviant behavior; and have lower religiosity (140).

Using both longitudinal and cross-sectional analyses, Jessor and colleagues found that such ''psychosocial unconventionality'' accounted for about a quarter of the variance in marijuana use (140). Another set of factors—lower perceived controls by friends, lower compatibility between what friends expect and what parents expect, greater influence from friends than parents, and (most strongly) greater perceived approval of and models for marijuana use and other problem behaviors among friends—accounted for about a third of the variance in marijuana use (140). Jessor found that problem drinking[45] had predictors markedly similar to those of marijuana use—an expected result given the high correlation between marijuana use and problem drinking (139).

Similar associations have been found with other behavioral factors. Robinson and his colleagues found that the use of unhealthful weight control practices (use of diet pills, laxatives, and diuretics for both boys and girls and self-induced vomiting for weight control among girls) were also significantly (although weakly) associated with substance use for both boys and girls (237).

These findings derived from problem behavior theory have been instrumental in advancing understanding of the covariation between substance use and other problems. Nonetheless, problem behavior theory suffers from several limitations. It provides only a partial accounting of problem behaviors, leaving many such behaviors without explanation. It does *not* empirically examine the restricted set of sociological and demographic factors that are its foundation. But most importantly, the focus on behaviors, perceived environment, and personality factors may result in victim blaming and the channelling of interventions too narrowly toward individuals and their behavior, to the exclusion of other possibilities.[46]

Generally, Baumrind found that adolescent substance use was better predicted by parental behavior than by the personal characteristics and early behavior of the adolescents (26). Nevertheless, Baumrind found that some personal characteristics were associated with substance use. Characteristics of children that Baumrind found to be associated with later substance use included lack of social confidence (shyness), as well as problem behavior at age 9. Baumrind's findings concerning shyness are consistent with Kellam's earlier findings (26,157,158). Attributes of adolescents that Baumrind found to be related to substance use included low cognitive competence, concern about peer approval, and lack of concern about adult approval (26).

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[44] Also see D.W. Osgood and J.K. Wilson, ''Covariation of Adolescent Health Problems,'' 1990 (216).

[45] Two measures of problem drinking were used for these analyses: frequency of drunkenness in the past year and drinking-related negative social consequences.

[46] In addition, the term ''problem behaviors'' carries an unfortunate connotation and may in some respects be historically and culturally bound, as well as oriented to adult conceptions of adolescent problems. For example, ''activist protest'' was initially examined as a problem behavior (142); at other times, or by other analysts, student apathy might legitimately be considered a problem behavior, and activism an indicator of ''social health'' (96,224). It is interesting to note that activist protest was not found to fit the explanatory profile for problem behavior (142). Jessor sometimes uses the term ''transition proneness'' instead of ''problem behavior'' to connote that what are termed problem behaviors among adolescents are sometimes reflective of precocious transitions to adult behaviors, such as the initiation of drinking or sexual intercourse (139). Sometimes, of course, they are illegitimate or problem behaviors for all ages (e.g., marijuana use, problem drinking).

Relationship Between Mental Health Problems and Use of Psychoactive Substances by Adolescents

Do adolescents use and abuse alcohol and other drugs because they have emotional or other mental health problems? Little research has addressed this important question, and the results are inconclusive (26).

Observers of clinical populations have often reported a co-occurrence of drug use and other mental disorders among adolescents (e.g., 249). A 1979 review by Jessor concluded that adolescents' marijuana use was not related to psychopathology or maladjustment (136), but some studies have shown that substance use has been preceded by depressed mood (153,209). Data from the National Institute of Mental Health's Epidemiologic Catchment Area study suggest that individuals who had a depressive or anxiety disorder before age 20 were twice as likely to have a substance use disorder in young adulthood (60,230). Although this finding does not necessarily mean that adolescents who use substances have mental health problems, another analysis from the Epidemiological Catchment Area study found that individuals who reported having used drugs early (before age 15) also reported a number of mental health problems at an early age (237).

School, Work, and Societal Impacts on Psychoactive Substance Use by Adolescents

In comparison to the amount of research on families and personal characteristics of adolescents, there has been little empirical research to test the specific impacts of schools, work, and society on psychoactive substance use. However, reasonable hypotheses have been developed based on observations of how these environments affect other aspects of adolescent development, behavior, and health.

Schools—Schools exert both direct and indirect influences on patterns of drug and alcohol use (262). In particular, schools are influential in the kind of self-concept an adolescent develops.[47] Schools influence whom adolescents come into contact with and help structure the activities of the adolescent over the course of the week (262). Adolescents typically make at least two school transitions that may put them at risk for substance use and abuse: the elementary to junior or middle high school transition, and the junior or middle high school to high school transition. Each of these transitions is likely to take the adolescent from a more to a less personal and protected school environment (86,89,254). In addition, school environments differ in exposure to and acceptability of drugs and alcohol. Young adolescents who attend school with older teenagers are more likely than are young adolescents who are more segregated from older teenagers to be exposed at an early age to substance use (262).

Some adolescents (e.g., those with prior academic difficulties, prior psychosocial problems, or who lose a large number of friends during the school transition) are at increased risk for adaptational difficulties (30,240).

Work—Over the past 100 years, adolescents' access to legitimate adult roles has been increasingly constrained. Some substance use has been seen as behavior "engaged in out of frustration or alienation from adult values" or as behavior "that affirms in a distinctively adolescent fashion, teenagers' desire to be adultlike" (262). Hence, one might expect working to decrease substance abuse by adolescents because it would help them feel more adultlike. The research evidence suggests that, in fact, work may increase substance abuse. Several studies indicate that teenagers who work, especially those who work long hours, are more likely than are their counterparts who do not work or who work fewer hours to use and abuse cigarettes, alcohol, and illicit drugs (121). No studies indicate that working deters drug and alcohol use by adolescents (96).

Steinberg suggests that some of the same factors that may increase adolescent substance use at school transitions—less adult supervision, increased exposure to older adolescents, and stress—may also increase working adolescents' use of psychoactive substances (262). In addition, paid work provides increasing financial autonomy and income to buy alcohol and drugs, and it may diminish school involvement. It is important to note, however, that the number of hours worked may be more predictive of substance use than whether the adolescent works or not. According to Steinberg, the evidence is fairly consistent in indicating that working in excess of 15 hours weekly for high school freshmen and sophomores, and in excess of 20 hours weekly for juniors and seniors, places adolescents at greatest risk for work-related problems such as drug abuse (262).

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[47] For further discussion of the evidence on how schools affect adolescent health, see ch. 4, "Schools and Discretionary Time," in this volume.

Society—It is ironic that at the same time adolescents are exposed to public service announcements deploring drug use, they are also exposed to advertisements and other media presentations that glorify the use of alcohol and other drugs (107). As Steinberg notes, "It is difficult indeed for program developers to persuade adolescents that using drugs and alcohol is undesirable when these same young people are bombarded daily with messages designed to persuade them that they are mood- and image-enhancing" (262).

Other commentators have noted an overall trend of using more substances as society becomes more advanced and more complex (213).

Appetitive Effects of Drugs[48]

Most studies of risk factors for adolescent substance use have addressed the *initiation* of drug use. Studies that have looked at what makes adolescents persist after first using drugs have tended to ignore the effects of the drugs themselves. A recent overview of research on models of addiction noted that theorists were beginning to recognize the appetitive effects of drugs as important motivators for drug use (17). This recognition departs from earlier models of drug motivation that stressed the reduction of aversive withdrawal symptoms as the core motivation for addictive drug use (17). Furthermore, it has potential implications for drug abuse treatment and possibly for prevention:

> Conceivably, the person currently experiencing pleasurable drug effects may be relatively immune to concerns about potential untoward consequences, may be especially "primed" to redose with the drug, may attribute various positive events to the drug, and so on (17).

The appetitive effects of drugs have not been a particular focus of explanation for adolescent substance use.

Factors Associated With Adolescents' Use of Alcohol and Cigarettes

Factors Associated With Use of Alcohol—Using survey data collected from 499 10th, 11th, and 12th graders in four large suburban public high schools, Kline and his colleagues found several variables related to higher levels of drinking and to problem drinking behavior:

- adolescents' ratings of high levels of family disengagement and poor intrafamily communications;
- adolescents' ratings of peer approval of alcohol use;
- parental approval of alcohol use;
- poor social skills;
- positive expectancies for alcohol use (161a).

Despite the sophisticated model for statistical analysis Kline and his colleagues used, it is important to keep in mind that their data were collected in a cross-sectional survey. Thus, some or all of the variables—poor social skills, positive expectancies for alcohol use, peer approval, even poor family functioning and perceived parental approval—could have been effects of greater alcohol use rather than causes. Furthermore, the data were collected from a student population that was 96 percent white and may apply only to this population.

Jessor's research on initiation of drinking suggests that significant psychosocial risk factors (e.g., value on academic achievement) can be identified among adolescents who have not yet begun to drink (139).

Factors Associated With Use of Cigarettes—Miller and Slap recently reviewed evidence for the factors associated with cigarette smoking by adolescents (189). Although hundreds of associations have been reported in the literature, Miller and Slap's review found that the weight of the literature supported strong and consistent associations of smoking with only three variables:

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[48] *Appetitive effects* is the term for usually pleasurable sensations or feelings such as euphoria—instill a craving (or appetite) for continued use of a substance in order to prolong or re-create the desired effects.

- parental smoking,
- peer smoking, and
- sibling smoking (189).

The variables they found *not* to have strong and consistent associations with smoking by adolescents were knowledge and attitudes about smoking, demographic factors, school activities, and psychologic factors. Miller and Slap noted, however, that several flaws in the research methods used to investigate risk factors for smoking limit interpretation of all such data, and they concluded that the research evidence had little utility for the design of interventions.

Summary: Factors Associated With Psychoactive Substance Use and Abuse by Adolescents

The epidemiological evidence on the prevalence of psychoactive substance use by adolescents and the evidence on risk factors suggest that the use of alcohol or other drugs by adolescents cannot be considered a single behavior with a simple cause. To some extent, one-time use of some psychoactive substances (especially alcohol and tobacco, but perhaps even marijuana) is common among contemporary U.S. adolescents, but one-time use does not *necessarily* suggest the presence of some untoward risk factor. For very low levels of use of some substances, it would be difficult to distinguish between the characteristics and social circumstances of users and nonusers.

On the other hand, a number of risk factors have been associated with *frequent or heavy use* of psychoactive substances (with such use defined differently in different studies for different substances). These risk factors for frequent or heavy use include substance-abusing parents, dysfunctional families, placing a low value on academic achievement, having low cognitive competence, early problem behaviors, being shy, having non-drug-related mental health problems, and association with drug-using peers.

Much of what is known about risk factors for adolescents' abuse of alcohol and other drugs and the implications for the prevention of such abuse is summed up by Steinberg, in his review for OSAP in DHHS (263). In that review, Steinberg concluded:

> . . . the young person who approaches adulthood with a sense of confidence and purpose and with well-developed social and instrumental competencies; who associates with peers who value achievement and responsible behavior and who devalue drug and alcohol use; and who spends time in settings which are adequately supervised by adults is at relatively low risk for substance abuse. In contrast, the young person who has few present skills and little hope for the future; who associates with peers who embrace an antisocial or a pro-drug lifestyle; and who spends a large part of his or her day isolated from adults runs the risk of developing drug and alcohol problems (263).

One policy dilemma may lie in deciding how to allocate resources among different approaches to the problems of psychoactive substance use by adolescents. Alternatives include reducing the supply of drugs,[49] reducing the demand for drugs (e.g., by efforts to prevent any use of any psychoactive substance by any adolescent or to prevent use that results in injury, incapacity, dysfunctionality, destruction, or damage to self or others), and treating adolescents with substance use problems who appear to be in the most trouble. Unfortunately, as the preceding discussion on risk factors and the discussion below on consequences of adolescent drug use suggest, available research provides only partial guidance on this question.

Consequences of Psychoactive Substance Use by Adolescents

Given concerns about the harmful consequences of psychoactive substance use, it is surprising that the research literature on the short-term and longer term effects on adolescents is so sparse (25,152). As Newcomb and Bentler have stated, "Following the area of treatment, consequences of teenage drug use are the second least understood and researched area of child and teenage substance use" (208). The research literature on adolescent substance use is replete with studies on risk factors, age of onset, and incidence and prevalence, but the implications of use for the mental, physical, and social development of adolescents are only recently receiving the attention of serious investigators. Kandel notes:

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[49] *Supply side* prevention efforts have included legislative efforts to prohibit the sale and consumption of alcoholic beverages (e.g., the 18th amendment to the U.S. Constitution, minimum drinking age laws); to restrict access to pharmacologic agents (e.g., interdiction, treaties on psychotropic drugs, the Uniform Controlled Substances Act [Public Law 91-513; 21 U.S.C. 800 *et seq*. and 21 U.S.C. 100 *et seq*]); and to regulate the availability of tobacco products and alcohol (e.g., advertising codes, laws banning cigarette vending machines). Supply side prevention efforts have tended to be oriented toward law enforcement, regulation, and punitive measures imposed on violators (195). *Demand side* prevention has sought methods of deterring use through information, persuasion, development of alternatives, and the enhancement of individual and family resistance to potential abuse.

> Despite the initiation of a relatively large number of longitudinal studies in the last decade, more is known at this time about the antecedents of initiation of drug use than about the consequences of use either in adolescence or in young adulthood. Very little is known about how patterns of drug use affect health, psychological well-being, and adult participation in the labor force, marriage, or parenthood (152).

In addition, most of what is known establishes the coexistence of certain adolescent health problems (e.g., delinquent behavior, drug use, pregnancy [216]), but not that one problem causes another.[50] This section will examine briefly the association between adolescent substance use and subsequent physical and mental health problems, educational achievement and employment, adolescent sexual activity and pregnancy, marriage and divorce, and delinquency.

Physical Health Consequences

The pharmacologic[51] effects of various psychoactive substances on the human body have been widely studied. Box 12-A, presented earlier in this chapter, notes some of the pharmacologic actions of major classes of psychoactive substances. Few studies have been done on the effects of psychoactive substances on adolescents.

In addition to the properties of drugs noted in box 12-A, the mode of ingestion clearly has health implications. For example, the ingestion of nicotine by smoking tobacco has different effects than the chewing of smokeless tobacco does (317,320). Similarly, the ingestion of cocaine by smoking freebase has effects that differ from the effects of snorting powder cocaine. The hazards to adolescents of human immunodeficiency virus (HIV) infection associated with the sharing of dirty needles or other intravenous drug use equipment are well-established.[52] Inhalation of solvents or aerosols can cause liver damage, cardiac arrest, or neurological damage (62,68).[53] Another mode of death is through suffocation due to inhalation of a solvent in a closed space (i.e., a plastic garment bag).

As noted above, relatively few adolescents die from unintentional drug poisoning. In 1988, the NIDA DAWN system reported that 9 adolescents between 10 and 14 years of age and 79 15- to 17-year-olds died as a result of drug toxicity (302). Suicide attempts, however, are a different story. Of the 13,975 adolescents between 10 and 17 years of age who were brought to emergency medical services responding to the DAWN survey in 1988, 61.8 percent were suicide-related drug cases (302). Thus, intentional overdose is a more serious threat to life than unintentional poisoning from a lethal dosage.

While alcohol has been extensively studied in connection with accidental injuries,[54] other drugs have not (202). No systematic epidemiological studies have been conducted to identify what role other drugs may play in various injury events. Nonetheless, it is likely that substances other than alcohol share some common traits which increase risk of accidental injury or death. Thus, it may be instructive for future research to examine what is known about the consequences of illicit and other drug use on adolescent accidents and injuries.

It is well established that alcohol use contributes to a significant number of adolescent accidents and injuries. The most obvious examples of alcohol's role in adolescent injuries are automobile accidents in which alcohol is a factor. Adolescents are at higher risk than adults of becoming involved in a motor vehicle accident if they have been drinking (167). In 1984, for example, 15- to 24-year-olds constituted 20 percent of the population but accounted for 35 percent of drinking driver deaths. In

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[50] For a fuller exploration of the significance of covariation among selected health compromising behaviors, see D.W. Osgood and J.T. Wilson, "Covariation of Adolescent Health Problems," 1990 (216).

[51] *Pharmacologic* means related to the nature, chemistry, effects, and uses of drugs.

[52] For further information on transmission of the HIV virus, acquired immunodeficiency syndrome (AIDS), and AIDS-related complex, see ch. 9, "AIDS and Sexually Transmitted Diseases: Prevention and Services," in this volume.

[53] According to Cohen (62), some of the volatile solvents are known poisons, including carbon tetrachloride, benzene, hexane, and leaded gasoline. Hexane and leaded gasoline can cause polyneuritis, and the latter can produce encephalopathy. Toluene has been linked to disorders of the kidney, nervous system, and bone marrow. Sudden sniffing death may result when a solvent or aerosol propellant is inhaled and the oxygen content of the blood is reduced. Ventricular fibrillation or other arrhythmia occurs and the person dies abruptly (62). Inhalants tend to be subject to "fad" use. Gasoline, vegetable oil spray, transmission fluid, liquid shoe polish, amyl nitrite, isobutyl nitrite, gold or bronze paint sprays, paint thinners, and model airplane glue have been used at various times.

[54] For further discussion, see ch. 5, "Accidental Injuries: Prevention and Services," in this volume.

1988, 3,158 adolescents ages 15 to 19 died in alcohol-related crashes (324).

Alcohol is also involved in nearly 40 percent of adolescent drownings (132,215,217,259,335). And, when fatal pedestrian and bicycle accidents are evaluated, alcohol again assumes a major role. In 1988, nearly a third of the victims of fatal pedestrian or bicycle accidents had a blood alcohol content of 0.01 percent or more, and approximately a quarter of those victims had blood alcohol concentrations in excess of 0.10 percent (324). Thus, as discussed elsewhere in this Report, it appears to take less alcohol to precipitate accidents among young people than among older adults.[55]

Mental Health Consequences

Just as mental health problems as predictors of adolescent drug use have not been studied extensively, the mental health consequences of adolescent drug use have received little attention. In a 1986 study by Kandel and her colleagues, adolescent smoking predicted elevated depressive mood scores among female young adults and elevated scores on a psychosomaticism scale among male young adults (152). Illicit drug use also predicted greater likelihood of consultation with a mental health professional (particularly among females). "Thus," the authors conclude, "while use of cigarettes predicted dysphoric mood, only illicit drug use predicted discomfort severe enough to seek help from a professional" (152).

Newcomb and Bentler's research also suggests that specific types of drugs produce different mental health consequences (208). For example, frequent use of cocaine among the adolescents they studied increased loneliness, suicidal thinking, and psychotic behavior, while decreasing the user's social supports. On the other hand, alcohol (when used by itself) reduced loneliness, increased social support, and enhanced the drinker's positive self-feelings (208).

Educational Consequences

In 1988, Mensch and Kandel examined the relationship between drug use and the likelihood an adolescent would drop out of school (184). Using event-history analysis (which specifies the dynamic relationship between the use of drugs and completion of one's education), they examined data from the National Longitudinal Survey of Young Adults, which interviewed over 12,000 subjects aged 19 to 27 in 1984, 5 years after the initial survey. They found that prior use of cigarettes,[56] marijuana,[57] or other illicit drugs[58] increased the propensity of both sexes to drop out of school. The earlier an adolescent was initiated into use (of alcohol, marijuana, or other illicit drugs for males or cigarettes and marijuana for females),[59] the more likely it was that he or she would not have graduated from school by the time of the survey. In their multivariate analysis, Mensch and Kandel controlled for various factors (e.g., parental education, family intactness, self-esteem) that could influence both drug use and dropping out of school, leading them to the conclusion that dropping out is a partial function of drug use itself. At the same time, however, Mensch and Kandel found that early intercourse and pregnancy among females were both very highly related to dropping out of school and were more likely to lead to dropping out than was early drug use (184).[60]

In an earlier analysis based on data from 1,004 men and women interviewed when they were 15 or 16 and then reinterviewed in 1980-1981 at age 25, Kandel and her colleagues found that substance use during adolescence[61] had very little effect on the level of education attained by young adulthood (339). The most predictive factor related to eventual educational level was the educational aspiration of the adolescent.

Employment-Related Consequences

Using life and drug histories of 1,325 young adults aged 24 and 25 in 1980-1981, Kandel and Yamaguchi found that those interviewed who were ever illicit drug users in adolescence tended to have greater difficulty in obtaining and holding a job (155). These young adults also had a higher rate of unemployment and had experienced greater turnover than their cohorts who had not used drugs in the 10th and 11th grades. However, Kandel and Yamaguchi point out that the causal order between job turnover and drug use is far from clear (152,155). There may be preexisting differences among individuals who start using drugs, and the relationships among employment problems and drug use may be attributable to these underlying variables rather than to the drugs themselves.

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[55] See ch. 5, "Accidental Injuries: Prevention and Services," in this volume.

[56] Measures of use: Ever, last year, or 100 or more times ever.

[57] Measures of use: Ever, last year, or one or more packs per day in the last 30 days.

[58] Measures of use: Ever, last year, or 40 or more times ever.

[59] Mensch and Kandel attribute the gender differences to differences in the social implications of these substances for males and females (184).

[60] Ch. 10, "Pregnancy and Parenting: Prevention and Services," in this volume, considers risk factors for, and consequences of, adolescent sexual activity and pregnancy.

[61] Such use was defined as use of any of 12 classes of drugs 10 or more times in a lifetime.

Sexual Activity, Pregnancy, and Pregnancy Outcomes

The use of drugs—including cigarettes and alcohol—by adolescents has been associated with early sexual experimentation and permissive attitudes about sexual behavior (216,338).[62] Various studies have revealed a clustering of the variables of early sexual behavior in adolescents and early onset of the use of alcohol and tobacco (137,141,216). The Institute of Medicine cautions, however, that a causal link between alcohol use and early sexual activity has not been proven, despite the disinhibitory effects of alcohol (200).

Studies have varied as to whether there is a relationship between the use of illicit drugs and premarital pregnancy (216). A 1980-81 study of 706 New York women who had participated in an earlier adolescent survey in 1971-72 indicated that women currently or formerly using illicit drugs other than marijuana were about twice as likely as other women to become pregnant before marriage (338). Similarly, Elster and his colleagues found that male and female adolescents who used marijuana and other drugs were about twice as likely as nonusers to become parents during adolescence (84a). In reviewing these and other findings, Osgood and Wilson noted that the findings relating substance use to adolescent parenthood and pregnancy were roughly evenly divided between significant positive associations and statistically insignificant relationships (216). Those relationships that were found (e.g., 84a,338) were generally weak (216). A more recent study by the U.S. General Accounting Office (GAO) came to the same conclusions (283).

Poor pregnancy *outcomes* have been associated with smoking and other drug use in several studies of adult mothers (185,210,226,328). For example, mothers who smoke risk preterm delivery, premature detachment of the placenta with adverse consequences for the mother, placenta previa,[63] bleeding during pregnancy, and prolonged premature rupture of membranes, as well as exposing their infants to low birthweight and impaired physical and intellectual development (185,317). The use of alcohol (286) and crack cocaine (283a) by pregnant women can have serious consequences for their infants.

In addition, some studies have found a relationship between drug use and the presence of a sexually transmitted disease (216).

Marriage and Divorce

Young adults aged 24 to 25 who used drugs as 10th and 11th graders were found, in two studies, to be more likely than nonusers to become separated or divorced from their spouses (152,339). Newcomb and Bentler ascribe these consequences to stunted maturation:

> Childhood and adolescence are critical periods for the development of both personal and interpersonal competence, coping skills, and responsible decision-making. Drug use is a manner of coping that can interfere with or preclude the necessary development of these other critical skills if it is engaged in regularly at a young age. For instance, if a young teenager learns to use alcohol as a way to reduce distress, he or she may never learn other coping skills to ameliorate distress. Thus, teenage drug use may truncate, interfere with, or circumvent essential maturational processes and development that typically occur during adolescence. As one result, teenage drug users enter adult roles of marriage and work prematurely and without adequate socioemotional growth and often experience greater failure in these adult roles (208).

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[62] See ch. 9, "AIDS and Other Sexually Transmitted Diseases: Prevention and Services," and ch. 10, "Pregnancy and Parenting: Prevention and Services," both in this volume, for a discussion of U.S. adolescents' sexual behavior and issues related to pregnancy and parenting among U.S. adolescents.

[63] *Placenta previa* is a condition in which the placenta develops in the lower uterine segment, in the zone of dilatation, so that it covers or adjoins the internal os. Painless hemorrhage may result.

Delinquency

The link between drug use and other forms of adolescent delinquent behavior[64] is well established (82,84,143,278), although far from every drug-using adolescent engages in other forms of delinquent behavior (216).[65] For example, in 1970, Robins and colleagues found that men who were marijuana users in adolescence were more likely as young adults to be violent, have police records, and to fail to graduate from high school (234). But the nature of that association is more elusive, despite the popular notion of the individual led into a life of crime by drugs. A basic question is whether drug use and delinquency are part of a single syndrome or whether developmental stages can be identified when each of these problems emerge (146,236). Examining a national sample of adolescents, Elliott and Huizinga found that delinquent activities preceded experimentation with illicit drugs in about half of the subjects involved with both substance use and delinquency (82). The question of a common etiology remained unresolved.

Kandel, Davies, and others looked into this issue in 1986 and found that there was a predictive association between adolescent involvement with illicit drugs and subsequent engagement in theft among both males and females (339). They did not find a similar correlation between drug use and interpersonal aggression (fighting). Yamaguchi and Kandel found that any marijuana use in the period from adolescence to early adulthood predicts interpersonal aggression (for women) and use of other illicit drugs predicts participation in theft (339).

What Level of Psychoactive Substance Use Is Harmful to Adolescents?

While the preceding review of research on psychoactive substance use suggests that there *are* potentially harmful consequences associated with adolescent use of alcohol and other drugs, some investigators have challenged the notion that *any* substance use, however limited, will typically produce negative effects. These researchers suggest that *experimental* use of psychoactive substances[66] by adolescents is not *necessarily* harmful (25,208,252).[67] In fact, Newcomb and Bentler argue, "Infrequent, intermittent, or occasional use of drugs by a basically healthy teenager probably has few short-term and no long-term negative or adverse consequences" (25). Baumrind echoes a similar sentiment, seeing adolescent experimentation of various kinds as being more "health-enhancing" than are risk-avoidant behaviors that are phobic or sedentary (25).

For example, Baumrind cautions,

> We have yet to subject to rigorous empirical tests the various hypotheses proposing that adolescent experimentation with psychoactive drugs has dysfunctional consequences. Thus, in my opinion, we still cannot show that regular marijuana use is implicated in a causal nexus which produces drug dependence or a dropout mentality, or lack of motivation to achieve and develop, or cognitive decrements relative to a previous level of functioning (25).

As evidence for this perspective, Baumrind points to studies that show that experimental or light marijuana use in nondelinquent populations is associated with such positive attributes as independence, friendliness, self-confidence, and intelligence (25).[68] Newcomb and Bentler found that in the quantities typically used by normal adolescents, cigarettes were more harmful to adolescent health than alcohol, marijuana, or most other drugs over a 4-year period (208).

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[64] See ch. 13, "Delinquency: Prevention and Services," for a detailed discussion of delinquent behavior during adolescence.

[65] In their review for OTA, Osgood and Wilson found correlation coefficients for the relationship between adolescent delinquency and the use of various substances ranging from 0.23 (tobacco and delinquency, males) to 0.53 (alcohol and delinquency, males) (216). While all correlation coefficients reported in the literature were statistically significant (that is, they were more likely to reflect a "real" relationship than to reflect a chance occurrence) and positive (that is, the more likely there was to be use of alcohol, other drugs, or tobacco, the more [rather than less] likely there was to be involvement in delinquent activities), the correlations were not perfect. A perfect correlation is reflected by a coefficient of 1.0. Correlation coefficients can be negative or positive.

[66] *Experimental use* refers to the act of using a psychoactive substance and experiencing its effects as a novelty prompted by curiosity.

[67] However, some researchers believe that there is a clear sequential order of progression from childhood or adolescent involvement with substances that are legal for adults (e.g., alcohol, tobacco) to illegal drugs (155). In their view, use of one substance opens the "gate" to another. As Newcomb and Bentler explained:

> "Past behavior is often the best predictor of future behavior, and in drug use this consistency extends to variants of the behavior in which similar but less serious types of drug use are good predictors of subsequent use of more serious drugs. A typical progression may be starting with coffee and tea, beer or wine, or cigarettes, moving to hard liquor and marijuana, and subsequently moving on to other illicit drugs such as amphetamines, cocaine, or heroin" (153).

However, Newcomb and Bentler caution that the gateway drug theory should not be overinterpreted: "Involvement at one stage does not necessarily lead to involvement at the next stage; rather, involvement at the next stage is unlikely without prior involvement in the previous stage" (208).

[68] These studies demonstrate covariance but not causation.

Other researchers suggest that alcohol or other drug use during adolescence does not necessarily mean that drug use will be continued later in life (e.g., 139,208). For example, among the adolescents studied by Jessor, half (51 percent) of the males who were problem drinkers in 1972 were also problem drinkers in 1979 to 1981, while half (49 percent) were nonproblem drinkers (74,139). For females, the decline in problem drinking was more pronounced—26 percent of the problem drinkers in 1972 were problem drinkers in 1979 to 1981.

Similarly, the "sniffing" of psychoactive solvents (many of which are extremely toxic) is an abusive behavior that also seems to be abandoned by most users as they grow older. Research suggests that users often "mature out" of solvent inhalation (62,68).

The seeming contradiction between research showing that drug use can have harmful effects during adolescence and afterward and studies showing no harmful (and even some positive) effects may reflect, at least in part, the differential consequences of using different study populations, different levels of drug use, and different research designs in the available studies (216). For example, Baumrind generally uses a higher level of drug involvement than the "any use" standard employed by Kandel and her colleagues to define drug users (26). Similarly, Baumrind would remove such "heavy users" from the pool of research subjects when analyzing the effects of "experimental use" on adolescents. Thus, design distinctions can profoundly alter the database and permit or prevent discrete analysis of selected categories—thereby giving rise to results which appear to be in conflict with related data developed through a different approach. The lack of uniform definitions and consistent controlled variables, differences in populations (e.g., by age, geographic region, racial and ethnic composition), the inclusion or exclusion of particular substances—all combine to make analyses across studies exceedingly difficult and cloud efforts to measure the consequences of adolescent drug use.

Economic Costs of Drug Abuse by Adolescents

The economic costs to society of use and abuse of alcohol, tobacco, and drugs by U.S. adolescents ages 10 to 18 have not been estimated. The closest current estimates of some of the economic costs to society come from a report by Rice and her colleagues to ADAMHA's Office of Financing and Coverage Policy in DHHS (233).

In their report, Rice and her colleagues were able to estimate 1985 *core costs*—i.e., "all costs directly related to the treatment and support of persons with [alcohol and drug abuse] disorders as well as the indirect costs associated with these disorders"—for alcohol and drug abuse problems for individuals under age 15 and ages 15 to 44 (233).[69] [70] [71] Rice and her colleagues did *not* include the costs of smoking or other tobacco use in this study.

Rice and her colleagues estimated core costs related to *alcohol abuse* to be $58.1 billion, of which $796 million (1 percent) could be allocated to individuals under 15 and $34.9 billion (60 percent) to individuals ages 15 to 44 (233). Core costs related to *illicit drug abuse* were estimated to be $10.6 billion, of which $98 million (1 percent) could be allocated to individuals under 15 and $7.2 billion (68 percent) to individuals ages 15 to 44 (233). In addition to estimating core costs related to alcohol and drug abuse, Rice and her colleagues estimated *other related costs*. Other related costs included direct [related] costs of crime, motor vehicle crashes, social welfare program administrative costs, and costs associated with the destruction of property by fire. They also included indirect [related] costs of productivity losses for victims of crime, incarceration, crime careers, and time spent to care for family members because of their. . .illness'' (233). Other related costs of alcohol and illicit drug abuse could not be estimated separately for individuals under 15 (233).

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[69] *Direct costs* included by Rice and colleagues were the amounts spent in 1985 for personal health care for persons suffering from alcohol and drug abuse disorders, including hospital and nursing home care, physician and other professional services, and prescription drugs. Also included in direct costs were support costs related to the treatment of alcohol and drug abuse disorders, such as expenditures for research, training costs for physicians and nurses, program administration, and net cost of private insurance. *Indirect costs* were the value of lost output resulting from reduced productivity, lost work and housekeeping days, and losses due to premature death from alcohol and drug abuse disorders. For all ages together, core costs accounted for 83 percent of total alcohol abuse costs and 24 percent of drug abuse costs (233).

[70] Rice notes that the under age 15 group includes costs for 15- to 17-year-olds for several cost categories (including alcohol, drug abuse, and specialty institutions and Federal providers); thus, the costs of the under age 15 group are overstated, and the costs for the 15 to 44 age group are correspondingly understated in some instances (233).

[71] Total economic costs (including core and noncore costs) were estimated at $70.3 billion for alcohol abuse and $44.1 billion for drug abuse (233).

Prevention of Alcohol, Tobacco, and Drug Use and Abuse by Adolescents

Drawing from the common view that ''an ounce of prevention is worth a pound of cure,'' numerous strategies have been devised to prevent psychoactive substance abuse within American society.[72]

Primary and secondary prevention efforts have included both efforts to reduce the supply of drugs (e.g., minimum drinking age laws, drug interdiction efforts, laws banning cigarette vending machines) and efforts to curb demand for drugs (e.g., educational efforts, alternatives programs, resistance skills training). The discussion that follows focuses primarily on demand side prevention approaches but also considers some supply side approaches.

Demand Side Prevention Efforts

Historical Perspectives

Some of the first demand side prevention efforts emphasized the harmful effects of substances of different kinds (197a). At the turn of the century, Carrie Nation popularized the ''home-wrecking'' potential of ''Demon Rum.'' An anticigarette league was active in the 1920s, and films like ''Reefer Madness'' in the 1930s associated marijuana use with depravity. Scare tactics are still employed today, despite the fact that a considerable body of research has demonstrated they are ineffective and can sometimes stimulate experimentation (20,36,116,125,160,228, 241,266).

In large part, confidence in the fear-based appeals of the nascent prevention movement yielded to reliance on knowledge-based programs designed to disseminate factual information about drugs and their adverse consequences and ''affective education'' intended to clarify values and improve self-esteem and interpersonal social skills. As public concern about adolescent substance use grew in the 1970s, combinations of information and affective education programs were increasingly employed as prevention measures (19).

More recently, approaches to prevention variously termed social influence (227), psychosocial (36), or risk factor (53a) models have been devised to counteract environmental messages and peer behaviors which promote adolescent substance use. These approaches seek to ''inoculate'' a person against the social pressures which lead to undesirable substance use. They stress techniques for ''saying no'' to inducements to use a substance (''resistance skills'') (113) and may also include more general life skills and social assertiveness training (36,40,128,220,221).

At the same time these individually targeted, psychosocial approaches are being developed and tested, informational approaches, such as those using mass media, have continued (e.g., 24,33,34). Most recently, so-called systemic, broad-based, or comprehensive approaches to prevent adolescent drug use have been implemented (e.g., 220,221,223, 311). In these approaches, multiple members of local communities (e.g., business, political, and other community leaders, parents, teachers) and multiple channels (e.g., media, school curricula) are used in the prevention effort (113,313).

Categorizing Contemporary Demand Side Prevention Programs

Substance use prevention programs for adolescents can be categorized in a number of different ways, and the absence of a uniform typology can be confusing. One way of categorizing demand side prevention programs is to examine what strategies are used to produce a desired outcome—the ''how'' of the programs. Another way is to distinguish among the kinds of sites where activities occur—the ''where'' of program delivery. A third way is to examine what groups are their intended participants—the ''who'' of the programs.

Prevention Strategies—Using the first approach—categorizing prevention programs by examining what strategies are used to produce a desired outcome—one finds some of the major models of demand side prevention programs identified in the literature to be the following:

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[72] *Primary prevention* strategies are efforts to stop or modify the initial use of substances like alcohol, tobacco, drugs, and inhalants. *Secondary prevention* strategies are efforts to shorten the course of an illness or condition, or end a behavior after it has been initiated, usually by early identification and rapid intervention. In the field of drug abuse prevention, primary and secondary prevention efforts are often difficult to distinguish in practice, because target groups (e.g., groups of adolescent students, communities) may include some drug users. Early intervention efforts, such as student assistance programs, are discussed in the treatment section, below.

- *Knowledge/attitudes-based model*—This assumes that increased knowledge about the consequences of substance use will increase negative attitudes and thereby reduce the likelihood of use (195).
- *Normative education*—This aims to correct misperceptions about high levels of drug use by others (119).
- *Affective education model* (sometimes called a "values/decisionmaking" model)—This focuses on the individual and teaches self-examination and responsible decisionmaking consistent with one's values (195).
- *Resistance skills model*—This helps adolescents identify sources of pressure to conform and teaches methods of countering negative influences (113,195,227).
- *Life skills training model*—This combines drug-specific resistance skills training with training in more generic personal and social skills (36,37).
- *Alternative program model*—This is designed to provide adolescents with constructive community activities and opportunities for recognition or to offer high-risk adolescents special opportunities to compensate for the environmental deficits in their lives (274).

Sites—Using the second approach—categorizing prevention programs by the kinds of sites where activities occur—one finds that schools frequently have served as delivery sites. Schools have been the most popular location of programs in part because they offer a "captive" audience and convenience of administration.

One of the factors that may influence site location outside of a school setting is the target population. For example, if a program is intended to reach school dropouts, a school-based initiative may not be the most conducive to encouraging participation.

Family, peer, and community-based efforts have been less common than traditional school-based programs led by a teacher or primary prevention staff, although they are growing in acceptance (113,195). Family educational efforts may be provided in the school, home, or in a community facility. These programs typically provide parent education and training. Similarly, peer-based programs (i.e., programs which emphasize peer interaction and are sometimes led by adolescent peer role models)—while often implemented in the school setting—can be based in adolescent recreational programs or other places where young people gather. Churches, mental health centers, social clubs, hospitals, and work sites are also used on occasion as community-based sites for adolescent primary prevention activities. On occasion, site selection also may be based on facilities used by ethnic social networks.

Media campaigns have been a popular means of disseminating information through television, radio, posters, and newspapers and magazines. While they are not site-specific in the same manner as school or community-based programs, media campaign materials may emphasize certain distribution channels over other available alternatives (e.g., posters on buses, pamphlets in certain locations frequented by adolescents, advertisements placed in selected publications or television time slots).

Target Populations—Using the third way—categorizing prevention programs through an examination of the groups who are their intended participants—one finds that some programs target all adolescents—either with or without specific age groupings. Others focus on adolescents they consider to be at "high risk" for substance use (frequently school dropouts, youth from disadvantaged homes, or minorities) or a particular peer group. Parents or families of adolescents may also become the focal points of prevention programs. And, finally, broad-based prevention programs may target an entire community for environmental or attitudinal change.

Summary—While these various methods of conceptualizing demand side prevention programs all provide some insights, the reality is that many programs, even those cited in the research literature, "mix-and-match" components in permutations that defy categorization. One seldom finds a "pure" model. Analyzing the types of preventive interventions being used in schools and communities across the country is even more difficult, because of the variety of approaches being used. A review of recent innovative projects (see below) illustrates this point.

Effectiveness of Demand Side Substance Use Prevention Efforts

As noted above and in table 12-9, current demand side prevention programs targeting (for the most part) individual adolescents can be categorized as information-based approaches, programs with a resistance skills emphasis, life skills training programs, comprehensive community programming with an initial focus on school-based resistance skills training, comprehensive health education and alternatives approaches. In addition to programs targeting adolescents, noncoercive prevention programs have targeted parents of adolescents.

Mass Media Prevention Programs—Mass media has been one of the Nation's most predominant channels for antidrug messages in the late 1980s and early 1990s. Programs of this type are among the most difficult to evaluate systematically because there are few ways to control exposure to the message. Further, at the same time individuals are exposed to antidrug media campaigns, they may be receiving numerous other messages, both consistent and conflicting with antidrug themes. Perhaps for this reason, the evidence on the effectiveness of mass media campaigns in reducing or preventing drug use and abuse is—and will probably remain—inconclusive.

One example of a national mass media approach to prevention is the Partnership for a Drug-Free America (33,34). The Partnership has saturated the electronic and print media with negative messages about drugs in order to create an environment that is hostile to substance-abusing behavior by influencing community attitudes (33,34). Partnership ads are designed to reverse positive perceptions about marijuana, cocaine, and crack and to dispel the notion that drug users are popular. Many of the ads appear on prime time television, and many use scare tactics. According to Black, the Partnership for a Drug-Free America is the largest advertising effort ever undertaken in the United States (34).

There have been no rigorous tests of the effectiveness of the Partnership for a Drug-Free America campaign. An evaluation of the Partnership for a Drug-Free America campaign reported by Black attempted to distinguish between "high exposure" and other media markets, but there appear to have been problems making this distinction (34). In addition, no tests of statistical significance were reported (34). Black did conclude, however, that 13- to 17-year-olds surveyed as part of the evaluation were the age group least likely to appear to have been influenced by Partnership ads (34).

Bauman and colleagues recently found that radio and television antismoking campaigns targeted towards adolescents in the Southeast United States were not successful in reducing smoking (24).

On the other hand, analyses by Bachman and his colleagues of trends in behavioral change (i.e., reported drug use) and perceptions related to drug use (i.e., perceived health risks, perceived social disapproval, availability of drugs) suggest that fear-based campaigns such as the Partnership's (which saturated many media from spring 1987 on) may be at least somewhat influential in reducing drug use (11,12). Bachman and his colleagues have found that as high school seniors' perceptions of risks associated with marijuana and cocaine use increased, their use of these drugs declined (11,12).

Adolescent Alcohol Prevention Trial (AAPT)—In addition to information delivered through the mass media, information-based approaches to prevention are delivered as part of classroom-based prevention strategies.[73] One example is AAPT, which was designed in part to test the effectiveness of an alcohol abuse prevention curriculum based on normative education (119). The AAPT curriculum is based on research indicating that adolescents overestimate the prevalence of substance use, and it consists of eight sessions devoted to correcting misperceptions about adolescents' use of alcohol and other drugs (with an emphasis on alcohol) and about the acceptability of drug use by adolescents.

Graham and colleagues performed a 1-year followup study designed to test AAPT's effectiveness with respect to seventh graders' use of alcohol, cigarettes, and marijuana. Defining success in terms of participants' probability of remaining in "no use" status, as compared to a comparison group, Graham and his colleagues found that the program was most successful with students who had not tried any of the study drugs at the beginning of seventh grade. It was least successful with students who had tried tobacco by the beginning of the seventh grade

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[73] As noted by Goodstadt and Mitchell, the provision of some kind of drug-related information is part of every school-based drug education program (113).

Table 12-9—Overview of Selected Substance Abuse Prevention Programs

Program[a]	Target population	Target substances	Approach/ setting	Representative studies[b]
Information-based approaches				
1. Mass media	Community at large	Marijuana Cocaine Tobacco	Information/fear	Black, 1991; Bauman, 1991
2. AAPT	7th grade	Alcohol Tobacco	Normative education.	Graham, Collins, Wugalter, et al., 1991
Resistance skills emphasis				
Project SMART	7th grade	Alcohol Tobacco Marijuana	Resistance skills, affective education.	Hansen, Malotte, and Fielding, 1988; Graham, et al., 1990
DARE Program	5th & 6th grades	Drugs Alcohol Tobacco	Peer pressure resistance training delivered in classrooms by police officers.	DeJong, 1987; Aniskiewicz and Wysong, 1990; Clayton, Cattarello, Day, 1991
Project ALERT	7th grade	Tobacco Alcohol Marijuana	Information, normative education, resistance skills in a school setting.	Ellickson, Bell, Thomas, et al., 1988; Ellickson and Bell, 1990
Life skills training	7th to 10th grades	Tobacco Marijuana Alcohol	Personal and social skills (e.g., resistance skills, assertiveness, self-control, cognitive skills) taught through a combination of instruction, demonstration, feedback, reinforcement, behavioral rehearsal (practice during class), and extended practice.	Botvin and Eng, 1980; Botvin, Eng, and Williams, 1980; Botvin and Eng, 1982; Botvin and Dusenbury, 1989; Botvin, Batson, Witt-Vitale, et al., 1989; Botvin, Dusenbury, Baker, et al., 1989; Botvin, Baker, Dusenbury, et al., 1990; Botvin, Schinke, Orlandi, et al., 1989; Botvin, Baker, Filazzola, et al., 1990
Comprehensive community programming with an initial focus on school-based resistance skills training				
Project STAR	6th or 7th grade (grade of transition to middle or junior high school)	Tobacco Marijuana Cocaine	Psychological consequences, normative education, resistance skills training for adolescents, plus parent involvement in homework, plus media coverage.	Pentz, Dwyer, MacKinnon, et al., 1989; Pentz, MacKinnon, Dwyer, et al., 1989; Pentz, MacKinnon, Flay, et al., 1989; Johnson, Pentz, Weber, et al., 1990; Pentz, Trebow, Hansen, et al., 1990
Comprehensive health education	Kindergarten through 12th grade	All unhealthful life-styles including substance abuse	Information/affective education.	Connell, Turner, and Mason, 1985; Christenson, Gold, Katz, et al., 1985
Parent education	Parents	Varied	Varied	Shain, Suurvali, and Kilty, 1980; Grady, Gersick, and Steinberg, 1985

[a] KEY: AAPT = Adolescent Alcohol Prevention Trial; ALERT = Adolescent Experiences in Resistance Training; DARE = Drug Abuse Resistance Education; STAR = Students Taught Awareness and Resistance; SMART = Self-Management and Resistance Training.

[b] Full citations are listed at the end of this chapter.

SOURCE: Office of Technology Assessment, 1991.

(119). Graham and his colleagues suggested that adolescents who begin smoking in the seventh grade may be most rejecting of adult values and thus most resistant to drug prevention education (119).

Project SMART—Project SMART (Self-Management and Resistance Training) is a school-based program that takes a resistance skills approach to drug abuse prevention. Project SMART includes a 12-session program intended primarily to give students social skills for resisting offers of alcohol, cigarettes, and marijuana (120). Social skills sessions include teaching students about the various

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sources of social pressure to use drugs, techniques for resisting them, and role-play opportunities for practicing the resistance techniques. Affective education sessions focus more generically on personal decisionmaking, values clarification, and stress management techniques. Seventh graders have been the target population for Project SMART.

In a 1988 evaluation of Project SMART, Hansen, Johnson, Flay, Graham, and Sobel found that the social skills portion of the program—but not the affective part—was effective in reducing the onset of cigarette, alcohol, and marijuana use (123a). A subsequent evaluation by Graham and his colleagues investigated differential effects[74] of Project SMART by type of drug, gender, and racial/ethnic group (as compared to the usual school curriculum on drugs and alcohol) (120). Overall, the program was found to be effective for females, but not for males, and for Asians, but not for blacks, whites, or Hispanics (120).[75] As did Botvin's Life Skills Training programs and other prevention programs (see below), Project SMART had its strongest effects on cigarette use. It showed some statistically significant effects for alcohol use, but no effects on marijuana use.

Drug Abuse Resistance Education (DARE) Program—The DARE program is different from school-based interactive education programs such as Project SMART in that it uses specially trained police officers to teach fifth and sixth grade students about drug use (61). Police officers are believed to be an especially credible source of information for young adolescents. In addition, the training the police officers receive (80 hours) is more extensive than that given to many others who deliver prevention programs, such as peers or teachers (61). In 16 or 17 sessions, the DARE program teaches students self-management and refusal skills and instructs them in personal safety techniques. Graduates take an antidrug pledge during a formal graduation ceremony.

Evaluations of DARE have shown mixed results. According to DeJong, the program has some impact on boys, but not on girls, and only on the use of hard liquor and cigarettes (70). Clayton and colleagues found DeJong's evaluation to be seriously flawed, but one other evaluation reported in Clayton and his colleagues found no reductions in self-reported drug use or intentions to use drugs after the DARE program was implemented in 10 randomly chosen North Carolina schools (233a). Clayton et al.'s own evaluation of DARE among Kentucky sixth graders was also noteworthy for using random assignment to conditions (61). However, consistent with previous evaluations, Clayton and colleagues found no differences in self-reported cigarette, alcohol, or marijuana use shortly after completion of the DARE program, although DARE did achieve some small changes in students' attitudes towards drug use (61).[76] A fourth evaluation of a DARE program in Kokomo, Indiana, found reason to be "cautiously optimistic," but the Kokomo evaluation did not measure actual drug use (7).

Project ALERT—Project ALERT (Adolescent Experiences in Resistance Training) was a 7-year longitudinal resistance skills training study involving 30 Oregon and California schools (78,79). Teachers in Project ALERT led eight once-a-week sessions with seventh graders—including minorities, economically disadvantaged children, and children from disrupted families—with the intention of preventing alcohol, tobacco, and drug use. Three booster sessions were provided in the eighth grade.

In an evaluation of Project ALERT published in 1990, Ellickson and Bell reported that the outcome of the program differed somewhat depending on the drug evaluated (78). For example, Ellickson and Bell found modest short-term effects, but no effects at a 15-month followup, for alcohol use (78). Students who were experimenting with cigarette smoking at the beginning of the seventh grade intervention were more affected by the program (in a health-enhancing direction) than were nonsmokers or heavier users.

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[74] As in many other evaluations, methodological considerations make it impossible to discern the proportion of students who resisted drug use entirely as a result of Project SMART. Effectiveness in Graham et al.'s 1990 study was measured in terms of differences between program and control students on an index of average drug use.

[75] Graham et al. suggested several possible reasons that Project SMART may have been more effective with females, including: 1) seventh grade females may be more receptive to antidrug messages; 2) seventh grade females may find social skills training more relevant to them; 3) the project health educators were all female; and 4) females had lower pretest drug use to begin with (120). Ethnic minority students also had lower pretest drug use (120).

[76] The evaluators hypothesized that the finding of no differences could be due to an initially low base rate of drug use among the students, but it could also be a result of the comparison group also receiving some drug education as part of the existing science curriculum. The evaluation reported by Clayton and his colleagues was the first phase of a 5-year evaluation, so the opportunity exists to test for long-term effects on drug use behavior (61).

But students who were not users of marijuana or cigarettes at the beginning of the project were most affected in terms of subsequent marijuana use. There were no consistent differences in effectiveness of programs led by older adolescents v. adult health educators. There also were no consistent differences in effectiveness of programs for racial and ethnic minorities v. whites.

Ellickson and Bell's evaluation report is particularly useful because it permits detection of the fact that, despite the program, substance use in both the experimental and control groups did increase on average; reported "reductions" or "effects" were relative to the substance use experience of students in the control group (78). For example, by month 15 (after the three booster sessions in eighth grade), about 57 percent of experimental group students had "ever" drunk alcohol, 30 percent had at least tried cigarettes, and 8 percent had used marijuana at least once (78). In addition, some potentially important changes (such as the percent of "alcohol experimenters" who had used alcohol in the past month) were not in the desired direction. For example, the benefits of changes in the desired directions (e.g., the greater proportion in the experimental condition of moderate cigarette smokers who had apparently "quit" smoking) would have to be weighed against apparent "boomerang" effects to obtain a net benefit (92). The differences between experimental and control group students that were statistically significant were small, and their practical significance would require additional analysis.

Life Skills Training Programs—The programs known widely as life skills training have also been referred to by Botvin as "personal and social skills training" (36) and "generic cognitive-behavioral drug abuse prevention" (37). According to Botvin, the programs' distinguishing feature is their emphasis on the acquisition of generic personal and social skills.[77] These generic skills are applied specifically to drug-related situations; the skills are generally taught using a combination of instruction, demonstration, feedback, reinforcement, behavioral rehearsal (practice during class), and extended practice through behavioral homework assignments (36).

Life skills training programs have differed in the age group targeted (mostly 7th graders, but some 6th, 8th, 9th, and 10th graders), program length (from as few as 7 to as many as 20 sessions), frequency of sessions (from 1 to 2 class sessions per week), providers (mostly adults, but some peers), and the inclusion or not of booster sessions.

Early studies of the life skills training approach focused on prevention of smoking among young (e.g., seventh grade) white adolescents and generally found statistically significant—but generally small—reductions, particularly when booster sessions were employed (37,39,40,41,42,43,44,45). Some observers, however, questioned whether the results of this early research were generalizable to other substances, to nonwhite students, and in nonresearch settings (37). Further, life skills training (and other prevention research) had been criticized on methodological grounds, including the exclusive use of self-report data, inappropriate research designs, inappropriate statistical analysis, lack of demonstrated pretest equivalence in experimental and comparison groups, failure to examine attrition effects, failure to examine the extent of faithful implementation of the program model, and failure to examine changes in theoretically important mediating variables (19,37,97,113,241,274).

In a recent study designed to overcome methodological and other criticisms, Botvin and his colleagues implemented their approach among almost 5,000 junior high school students in 56 schools across New York State (37,38). Fidelity to program criteria was assessed, and only students who received at least 60 percent of the prevention program were included in the 3-year evaluation (37). A major focus of the evaluation was a comparison between an intervention providing formal provider training (more costly) and an implementation with videotaped provider training and no feedback (less costly); a no treatment group was also included (37).

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[77] According to Botvin, the primary distinguishing feature of the life skills training approaches is that they typically attempt to develop two or more of the following skills: 1) general problemsolving and decisionmaking skills (e.g., brainstorming, systematic decisionmaking techniques); 2) general cognitive skills for resisting interpersonal or media influences (e.g., identifying persuasive advertising appeals, formulating counterarguments); 3) skills for increasing self-control and self-esteem (e.g., self-instruction, self-reinforcement, goal setting, principles of self-change); 4) adaptive coping strategies for relieving stress and anxiety through the use of cognitive coping skills or behavioral relaxation techniques; 5) general interpersonal skills (e.g., initiating social interactions, complimenting, conversational skills); 6) general assertive skills (e.g., making requests, saying no, expressing feelings and opinions (36). The theoretical bases of the life skills training approach include social learning theory (18) and problem behavior theory (139,142,224).

Over a 3-year period (1 year of full program implementation and booster sessions in 2 succeeding school years), statistically significant effects for smoking and marijuana use were found for both training conditions, compared with the comparison condition (37). Effects were measured in terms of comparison and experimental group differences in average drug use scores on a post-test (37). No differences between experimental and control groups were found in overall drinking frequency or drinking amounts in any group, although there was a reduction in the frequency of getting drunk in the group with videotape-trained teachers (37). When a more conservative school-level analysis of the data was performed, significant effects for reductions in cigarette smoking (only) were retained.

This study's measures for testing the development of theoretically predicted skills were limited to self-reports by students of their confidence in their ability to use specific personal and social skills, and their knowledge of communication and general social skills (37). Only communication and interpersonal skills showed improvement (37). According to Botvin and his colleagues, this evaluation provided further evidence that life skills training is effective in at least delaying the use of substances other than tobacco and demonstrated for the first time the feasibility and effectiveness of the life skills training approach in typical classroom situations (37). However, the broad test of the life skills training approach reported in 1990 by Botvin and his colleagues was somewhat limited by having a sample that was 91 percent white and mostly suburban and rural. Previous research by Botvin and his colleagues with urban black (39) and Hispanic (41) students provided only tentative support for the effectiveness of life skills training with nonwhite adolescents (37).

Project STAR—Project STAR (Students Taught Awareness and Resistance)—part of the Midwest Prevention Project—is widely known as a broad-based, comprehensive community-based drug prevention intervention (220,221). The target group includes the entire adolescent population in 50 schools of the 15 communities comprising the Kansas City (Kansas and Missouri) metropolitan area. Begun in 1984, Project STAR sequentially attempted to involve the media, community organizations, and families in drug prevention in the Kansas City area, but the cornerstone of the program is a school-based education curriculum with an emphasis on resistance skills.

Photo credit: Education Week

Project STAR is an example of a contemporary school-based drug abuse prevention program that attempts to teach young adolescents the kinds of skills that will help them resist pressures to use drugs. These Kansas City students are participating in part of the Project STAR curriculum.

The Project STAR drug use prevention model builds upon earlier efforts to reduce adolescent pregnancy and cigarette smoking and to prevent heart disease. Its agenda covers tobacco, alcohol, and marijuana and the program focuses on sixth and seventh graders. In the first 2 years of the project, 22,500 sixth and seventh grade students participated in the school-based educational component. Other components (i.e., parent education, community organization, and health policy changes at the community level) have been added to the project sequentially—approximately one each year. Boosters are provided on a yearly basis through the 12th grade. Annual assessments are made of adolescent drug use in schools assigned to immediate intervention or delayed intervention control conditions.

Evaluation of broad-based community programs and mass media campaigns is exceedingly difficult and subject to numerous methodological problems (77), and reported results for Project STAR have varied somewhat. In a report on a 1-year followup, Pentz and her colleagues reported modestly, but statistically significantly, reduced *rates of increase* in cigarette, alcohol, and marijuana use by experimental v. control students in the week and month prior to the followup survey (220). In another analysis of 1-year followup data that used a smaller sample and different statistical methods, Dwyer, MacKinnon, Pentz, and their colleagues reported reduced rates of increase for cigarette smoking, mixed evidence for effects on marijuana use (depending on whether schools or students were used as the unit of analysis), and no evidence of an effect on alcohol use (77).

Another study compared the effects on high- v. low-risk adolescents[78] of 3 years of Project STAR (144). By 3 years into the project, experimental schools had been exposed to a parent organization program, parent-child communication skills training, initial training of community leaders in the organization of a drug abuse prevention task force, and mass media coverage, as well as the 1-year, 10-session, resistance skills curriculum for students. The comparison groups were exposed only to the initial training of community leaders in the organization of a drug abuse prevention task force and the media elements of Project STAR (144). Overall, this analysis found generally lower *rates of increase* for tobacco and marijuana use, but not for alcohol use, in program schools than in control schools. The only difference between high and low risk groups of students was a greater reduction in the rate of increase in cigarette smoking in those students exposed to the program during a 6th rather than 7th grade school transition.

Other studies by Pentz and her colleagues suggest reasons for variations in results across schools other than method of statistical analysis (77). Pentz, Trebow, Hansen and colleagues found, for example, that the greater the amount of the school-based portion of the program actually delivered to students in Project STAR schools, the less was the increase in drug use after a year (223). In one of six comparisons, there was an actual decrease in drug use among project students with more extensive exposure to the curriculum (223).

The Project STAR effort in Kansas City was evaluated with a quasi-experimental design. A replication in Indianapolis, Indiana (Project I-STAR), is being evaluated with a true experimental design.

Comprehensive Health Education—As prevention programs, comprehensive health education efforts are premised on the belief that children and adolescents can benefit from instruction in all phases of healthy living. Thus, sequential curricula have been developed for prekindergarten through the 12th grade, focusing on developmentally appropriate subjects. The prevention of psychoactive substance use can be either a separate segment within the instructional sequence or integrated throughout the health curricula (247).

In a 1985 evaluation of four comprehensive health education curricula for grades 4 through 7, based on a survey of 1,000 classroom programs in 20 States, the School Health Curriculum Project was identified as the most effective health education program (66). The School Health Curriculum Project is highly structured and emphasizes "hands-on" activities but requires significant teacher in-service training and student classroom time. The program appears to have been successful in deterring sixth and seventh graders from smoking, but its impact on other substance use has not been assessed (59,65).

Parent Education Programs—Parent education programs attempt to influence adolescent behavior by altering the interactions that occur within a family. Parents attend seminars or courses designed to help them encourage and support appropriate behavior in their adolescent family member. Typically, a program will provide factual information and training in discipline, communication, and other parenting skills. Sometimes, parent education programs are held in conjunction with programs for adolescents.

Parent education programs specifically geared toward substance use concerns have not been widely tested. Schaps and his colleagues found that only 4 percent of 127 drug education programs included in their review used a family involvement strategy (241). Nearly a decade later, Moskowitz found very few family-oriented educational programs targeted toward adolescent alcohol or drug problems in his review of the literature (195). Of those adolescent substance use/parent involvement programs that do exist, only two have been evaluated. The first, a 20-hour Parent Effectiveness Training program, which emphasized communications and problemsolving skills for parents, was examined in a 4-year, quasi-experimental study that showed short-term improvements in parenting skills but also revealed an increase in alcohol use among the children of participants (251).

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[78] High risk students were defined as those students: 1) who had previously used a so-called "gateway drug" (tobacco, alcohol, *or* marijuana); 2) whose parent(s) used tobacco, alcohol, *or* marijuana; 3) with higher numbers of friends perceived as having used tobacco, alcohol, *or* marijuana (cutoff not given); and 4) of higher age (measured as grade level). Gender was also used as an indicator of relative risk.

The second study looked at a program that combined drug education for students and 12 hours of parent training on drugs, adolescent development, decisionmaking, and communication (118). Preliminary results showed some improvement in parenting, but recruitment and attrition problems limit inferences about the validity of the findings.

Other studies of parent education programs which were not targeted toward substance use issues have tended to support the conclusion that these programs can improve parents' attitudes and skills, but that they have limited impact on an adolescent's behavior—including substance use (72).

Alternatives Programs—The provision of alternatives to alcohol and other drug use have had a long history in prevention efforts (113). According to Botvin, the original model for alternatives programs took the form of establishing youth centers in the community to provide a particular activity or set of activities:

> The underlying assumption of this approach was that adolescents could be provided with real-life experiences that would be as appealing as substance use and, therefore, involvement in these activities would actually take the place of involvement with substance abuse (36).

Examples of this approach, which provided a predetermined single set of activities for all participants, include Outward Bound (36). A second type of alternatives approach involves attempting to match specific alternatives with an individual's unfulfilled needs (36). For example, interpersonal needs, such as gaining peer acceptance, might be satisfied through participation in sensitivity training or encounter groups (36,274). Another way to categorize alternatives approaches is as 1) efforts to *provide positive activities* more appealing than drug use; and 2) efforts aimed at developing competence to *overcome individual deficits* in basic life skills, low self-worth, and limited experiences that place them at risk (113,274).

The provision of alternatives to psychoactive substance use is intuitively appealing and has been one of the approaches used in the contemporary "War on Drugs" (see below). As noted above, at least some the predominant risk factors for substance abuse (e.g., dysfunctional families, association with drug-using peers, school transitions) appear to be those that could be amenable to the alternatives approach. Unfortunately, however, there is little systematic research that can be used to evaluate whether alternatives work in preventing drug use and abuse by adolescents (36,113,241,242,274). For example, in a 1986 quantitative review of studies covering the period 1972 through 1984, Tobler found only 11 alternatives programs that had adequate evaluation data, and not all of the evaluations measured drug use by adolescents (274). In a subsequent meta-analysis of the same studies, Tobler limited her review to studies using drug use outcomes (274a).[79] In both meta-analyses, Tobler found that alternatives programs had the second greatest effects on drug use (274a) and related outcomes (274), after resistance skills and life skills training programs that involved peer interaction (274,274a).[80] Tobler concluded that alternatives programs were especially effective with "high-risk" adolescents such as drug abusers, juvenile delinquents, or students having school problems (274).

Further examination of the components of successful alternatives programs seems to be in order. For example, Swisher and Hu noted that some types of *activities* have been associated with substance abuse (e.g., entertainment, vocational, and social activities), while others (e.g., religious activities) have not (269a). Consequently, it is conceivable that some alternatives programs could be counterproductive if the wrong type of activities were selected (36). Feldman notes that it may be important to mix both troubled and nontroubled adolescents in alternative activities (88a) and both Feldman and Tobler note the importance of well-trained group leaders (88a, 274a).

Selected Supply Side Substance Use Prevention Efforts

Health protection is an aspect of prevention that acts through the passage of laws and regulations limiting access to substances believed harmful to health. Many of the psychoactive substances discussed in this chapter are illegal for use by people of all ages. As noted earlier, however, the psychoactive substances used the most by U.S. adolescents—alcohol and tobacco—are legally available for use by older people. Some public health measures have been taken to limit access to and use of these substances by adolescents. Others are under consideration. Supply side substance use prevention efforts discussed here are laws related to access by minors (e.g., minimum drinking and smoking ages) and some actions under consideration that would affect not only adolescents but all individuals (e.g., additional limits on advertising, increased excise taxes on cigarettes and alcohol). Relatively little research has been done on the effects of health protection efforts specifically on adolescents.

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[79] In a subsequent review, Botvin found only two studies of alternatives (peer tutoring and working in a school store), neither of which measured drug use (36).

[80] In Tobler's articles, resistance skills and life skills training programs are called "peer programs" because peer interaction (not peer leadership) is the key component (274,274a).

Minimum Ages for Drinking and Smoking—Between 1970 and 1975, 29 States lowered their drinking age to conform with a Federal shift in the voting age from 21 to 18 in 1970 (123). By 1984, however, 28 States had increased their legal drinking age. In 1984, the U.S. Congress passed the Uniform Minimum Drinking Age Act (Public Law 98-363). Under this law, increasing percentages of Federal highway funds would be withheld from States that did not make the drinking age 21. Currently, all 50 States and the District of Columbia have a drinking age of 21, although there are some exceptions to the general rule (e.g., for employment, with parental guidance, under medical supervision, and possession for purposes other than consumption) (123,290).

Age limits on possession of tobacco products are more lenient than those on alcohol (317). Changes are occurring, but the minimum age in most States is 18 rather than 21 (315).

Limits on Advertising—Recognizing that antidrug education messages compete with advertising that makes alcohol use appealing to adolescents (180), there has been congressional interest in limiting the advertising of alcohol and cigarettes (169). Cigarettes and hard liquor are not advertised on television or radio but can be advertised in magazines[81] and on billboards. Wine and beer can be advertised in any medium.

Further passage of restrictive advertising laws is problematic because of concerns about possible infringements on advertisers' constitutional rights. On the one hand, there is precedent for such action. The Public Health Cigarette Smoking Act of 1970 (Public Law 91-222), for example, banned prosmoking cigarette advertising on radio and television beginning in 1971. On the other hand, Goodstadt and Miller concluded that studies of the impact of alcohol advertising have demonstrated little to no effect on alcohol consumption (113). These studies have not been specific to adolescents.

Excise Taxes—Economists suggest that adolescents' use of alcohol and tobacco may be more sensitive to increases in price than adult's use of alcohol and tobacco (123). One way to increase the price of alcohol and tobacco is to increase excise taxes. As of spring 1990, Federal excise taxes had not been raised in real terms since 1951 (123). Beer, a preferred alcoholic beverage of adolescents, is taxed at one-third the rate of liquor.

In a simulation for ADAMHA's National Institute on Alcoholism and Alcohol Abuse (NIAAA), Grossman found that the raising of excise taxes on beer to the same level as taxes on liquor would reduce motor vehicle fatalities among 18- to 20-year-olds by 21 percent (123). Grossman found that an increased excise tax would have a greater effect on reducing fatalities than could be expected from increases in the minimum drinking age because the minimum drinking age can be evaded, at least in part. Grossman notes, however, that these simulations have not been tested empirically.

Simulations of the effects of excise taxes on cigarette smoking have focused on reductions in premature mortality as an outcome. Cigarette smoking generally does not result in fatalities until later in life (although there are short-term health effects of smoking for adolescents). Grossman's analysis of an increase in excise taxes on cigarettes found that over 800,000 premature deaths in the cohort of Americans 12 and over in 1984 would be averted. Coincidentally, an earlier analysis by Warner suggested that raising the excise tax would discourage approximately 800,000 adolescents from starting to smoke (331).

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[81] A check by OTA staff of several teen magazines suggested that such magazines do not tend to advertise cigarettes or alcohol.

Conclusions About the Effectiveness of Prevention of Psychoactive Substance Use

From the foregoing review of the research findings from selected contemporary efforts to prevent or delay the onset of psychoactive substance use by adolescents, and from the reviews summarized in table 12-10, it is clear that most demand side prevention programs targeted at individuals have yet to make a compelling case for their effectiveness. Some models show some positive effects in delaying increases in drug use, but the effects are generally small. Whether these models are of much practical significance in reducing drug use among adolescents is debatable. However, some programs may turn out to be effective in other important respects, such as enhancing adolescents' general life skills (e.g., social competence, decisionmaking).

Recognizing the limited evidence for the effectiveness of traditional school-based drug prevention efforts, as well as the wide variety of risk and protective factors apparently involved in drug use and abuse (see figure 12-6), some observers have urged that drug abuse prevention efforts not be limited to small-scale, time-limited, educational interventions, although these interventions have their place (36,113,172,273). Neither, say many observers, should prevention be limited to coercive supply side strategies such as minimum drinking ages, limits on advertising, or excise taxes (113,172).

Goodstadt and Mitchell, for example, recommend that the Nation take a *health promotion approach* to preventing alcohol and other drug use and abuse by adolescents. The health promotion perspective permits greater acknowledgement of the fact that psychoactive substance use problems may result from: a) what the user/drinker does, b) the properties of the drug, *and* c) the impact of social and physical environments (113). According to Goodstadt and Mitchell, "this appreciation for the diverse etiology of problems should increase the range, appropriateness, and effectiveness of prevention measures" because "problems with complex etiologies usually require diverse or complex solutions" (113). Further, "addressing the three elements would reduce scapegoating of any single factor":

Photo credit: Office of Technology Assessment

Current recommendations on preventing alcohol and other drug abuse among adolescents suggest that prevention efforts not be limited to efforts targeted at individual potential users—although these may be useful—but that they also focus on adolescents' environments.

> It would no longer be appropriate to "blame the victim" by attributing the abuse exclusively to the abuser's personal deficiency; nor would it be sufficient to condemn drugs as the cause of problems, or strive for prohibition as the sole solution for abuse; nor would individuals and communities be tolerant of environmental conditions or social practices that contribute to drug abuse (113).

The fact that these recommendations (and other similar thoughts) were published by OSAP suggest that a more comprehensive approach to psychoactive substance abuse prevention is possible (76,113, 313). Unfortunately, however, implementing systemic approaches may prove to be quite difficult (172).

Substance Abuse Treatment Services for Adolescents[82]

For some adolescents, the use of or experimentation with alcohol or other psychoactive substances may progress to a point where the adolescents develop physical, emotional, or social problems. When substance use becomes functionally incapacitating, health-threatening, or presents a danger to self or others, professional services may be necessary to treat the condition. The broad goals of substance abuse treatment can be defined as the

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[82] This section is based on the paper by James Emshoff and Ronni Margolin-Mankoff entitled "Treatment of Adolescent Substance Abuse: A National Review and Critique," which was prepared under contract to Carnegie Corporation of New York and the Carnegie Council on Adolescent Development for OTA's adolescent health report (85).

Table 12-10—Summary of Reviews of Evaluation Literature on Demand Side Substance Use Prevention Programs for Adolescents

Study[a]	Evaluations reviewed	Method of the study	Key findings and recommendations
Schaps, DiBartolo, Palley, et al., 1978, 1981	75 (127 programs)	Crosstabular and correlational analyses of primary drug abuse prevention programs, using 70 dimensions; included all psychoactive drugs. Studies had to assess a planned intervention and use drug-specific measures of effectiveness in terms of use, intention to use, or attitude toward use. Included unpublished manuscripts. Ninety percent of programs served target populations of college age or younger; 56 percent served high school age adolescents. Comparison groups were not required.	Most evaluations were poorly done; most studies ignored racial and ethnic characteristics; only 5 percent of programs were peer-led. Information-only programs were not effective; combination programs hold promise, but data are unreliable. More research is needed, particularly with regard to minorities; greater use of peers and parents should be explored; a repository for evaluation reports should be created; evaluation must be more rigorous and better documented.
Tobler, 1986	143 (98 studies)	Meta-analysis; reviewed substance abuse evaluations of variety of program types; controlled for effect size; included unpublished studies. Limited to young adolescents. Five modalities were examined: knowledge, attitudes, use, skills, and behavior; drugs, alcohol, tobacco, were included. Control group was not required for some studies.	Peer programs showed definite superiority in outcome across substance; alternative programs successful for "high-risk" adolescents; "for knowledge-only and affective-only programs solid evidence exists for discontinuing their use."
Bangert-Drowns, 1988	33	Meta-analysis; controlled for effect size; only school-based drug education programs were included. Covered elementary through college level; limited to publicly available studies; antismoking studies were excluded; only U.S./Canada studies were reviewed. Control group was required.	Most studies were of poor quality. Substance abuse education may alter knowledge and attitudes but is unsuccessful in changing drug-using behaviors of students; peer-led and group discussion models were more effective in changing attitudes; students who volunteered for programs reported lower drug use than compulsory participants. More rigorous research is needed but not on effect of education on knowledge; substance use education has not been effectively used in schools to date.
Moskowitz, 1989	NA	Literature review/focus on alcohol issues. Four types of interventions were examined, including primary prevention. Not oriented toward adolescents—general alcohol abuse review.	There is little evidence that primary prevention programs are effective; additional research is needed on affective education and social influence models; behavior is unlikely to be influenced by education or media efforts; parent attitude changes are not reflected in adolescent behavior; social norms must change; some prevention programs may actually increase problems; recommends large-scale social experiments combining control and prevention strategies.
Goodstadt and Mitchell, 1990	NA	Narrative literature review of evidence on noncoercive (drug education, mass media, and alternatives[b]) and coercive (legal deterrence) strategies, and conceptual analysis of health promotion (concept of lifestyle, community-based health promotion, community responsibility and empowerment) strategies.	Could not conclude with confidence that *drug education* (including school-based education and non-school-based parenting skills education) is either effective or ineffective. Criteria for effective school-based drug education appear to include: targeting subpopulations with a uniform level of use, or incorporating elements and processes that recognize the needs of varying subgroups; attending to the major personal and social determinants of human behavior; implementing programs with adequate intensity of time and effort, staff training, and adequate administrative and community support; integrating school-based programs into the larger community. Studies of *mass media* antidrug campaigns do not encourage optimism about effectiveness. *Laws and regulations* play a significant role in controlling average level of alcohol use and abuse in a population, but evidence for the effectiveness of legislation (legal deterence) in controlling individuals' drug use is neither encouraging nor consistent. Recommends a *health promotion perspective*, which would develop policies to address the implications of the diverse causes of drug use problems (i.e., behavior, properties of the drugs, and the impact of the social and physical environment).

KEY: NA = not available.

[a] Full citations are listed at the end of this chapter.

[b] This review's evaluation of the alternatives approach summarized Tobler's findings (274).

Continued on next page

Table 12-10—Summary of Reviews of Evaluation Literature on Demand Side Substance Use Prevention Programs for Adolescents—Continued

Study[a]	Evaluations reviewed	Method of the study	Key findings and recommendations
Botvin, 1990	35 interventions	Narrative review of theoretical and evaluation literature on 4 approaches: informational, affective, alternative, psychosocial.	Except for the more recently implemented psychosocial approaches (resistance skills alone or in combination with life skills training), primary prevention approaches targeting adolescents have not been successful in reducing actual substance use because they have not focused on documented risk factors. Some methodological and dissemination/implementation problems with the psychosocial approaches remain, but these psychosocial approaches should be further disseminated because they can reduce susceptibility or vulnerability to environmental factors and reduce potential intrapsychic motivations to use drugs. They can be used as substitutes for widely-utilized school-based prevention programs that rely on intervention strategies that have either been found to be ineffective or have no scientifically defensible basis. Several additional levels of intervention need to be adopted: at the broadest societal level, eliminate or reduce environmental influences promoting or facilitating smoking, drinking, and drug use; at the interpersonal level, go beyond strategies that rely solely on school-based interventions; and, at the intrapsychic level, reduce potential motivations to engage in substance use.

SOURCE: Office of Technology Assessment, 1991.

elimination of chemical dependency and related undesirable behaviors and the restoration of the individual under treatment to a healthy and functionally appropriate status (201).

But despite a general consensus about the broad goals of substance abuse treatment, substance abuse treatment for adolescents is often fraught with controversy. It is not always clear when—or if—an adolescent requires treatment for substance use. In addition, there remains disagreement about the respective virtues of abstinence and responsible use of psychoactive substances as treatment outcomes. Nor is there agreement within the treatment community or its critics regarding the efficacy or effectiveness of various kinds of treatment, desirable length of treatment, or criteria for matching individual clients to particular treatment settings. In a comprehensive 1990 study on drug treatment, a committee of the Institute of Medicine concluded that the state of knowledge on drug treatment effectiveness was worst with respect to treatment for adolescents, and this committee recommended that drug treatment of adolescents be studied intensively (201). Exploring the variety of substance abuse treatment services could illustrate the needs for additional research, highlight some of these points of contention, and provide a conceptual framework for future policy deliberations on substance abuse treatment services for adolescents.

The importance of such exploration becomes clear when one considers the number of adolescents whose lives are affected by treatment and how many others might benefit if additional services were available. However, assessing the number of U.S. adolescents in substance abuse treatment is difficult because of limitations in data sources. Several data sources were used to gather the information presented below—the National Drug and Alcohol Treatment Unit Survey (NDATUS) (308,309); the Chemical Abuse Treatment Outcome Research (CATOR) network, which provides outcome data for private treatment centers (126); and the Treatment Outcome Prospective Study (TOPS) at the Research Triangle Institute (134). Information was not always available regarding specific issues, in particular interactions between race and age.

The NDATUS census of private and public drug abuse treatment provides a cross-sectional snapshot of treatment on October 30, 1987, and not a count of clients served in an entire year. Among other problems with NDATUS is its low response rate: a total of 22.5 percent of the surveyed treatment units did not respond to the NIDA-sponsored survey. Thus, OTA multiplied totals by 1.29 to reflect an estimate of the numbers served by nonresponding programs. This extrapolation seems to be a closer representation of the total population served than the number calculated by including only the 77.5 percent.

A second correction factor can be estimated in order to convert the point prevalence data to yearly totals served. Dividing the number of drug abuse clients served in 12 months by the number in treatment on October 31, 1987, one finds that 3.21 people were served in the 12-month period ending on that date. The ratio of annual total served to the total served in the point prevalence data for alcoholism treatment is 4.23. Applying these ratios to subtotals based on age and setting yields the only available estimate for total clients served by drug and alcohol treatment programs in a 12-month period.

Using these adjusted figures, an interesting picture emerges. Approximately 76,000 children and adolescents under age 18 were in drug and alcohol treatment programs on the day the most recent NDATUS was taken in 1987 (308,309). An estimated 49,000 of these minors were in drug abuse treatment (15 percent of the total population of all ages in drug abuse treatment), and the other 27,000 were being treated for alcoholism (6 percent of the alcohol treatment population of all ages). Over the course of a year, it is estimated that nearly 272,000 adolescents are treated for substance use—157,000 for drugs and 115,000 for alcohol. Adolescent males made up 55 percent of the adolescent drug treatment population and 67 percent of the adolescent alcohol treatment populations.

Substance abuse treatment services for adolescents, provided to adolescents after assessment and referral, fall broadly into five sometimes overlapping categories (see table 12-11):

- self-help groups,
- outpatient treatment (including day treatment),
- residential treatment,
- inpatient treatment or hospitalization, and
- other.

Treatment is usually, but not always (e.g., self-help), preceded by assessment and diagnosis.

In addition to there being overlap within these five categories of substance abuse treatment services, there may be some overlap between prevention strategies and treatment. Thus, for example, prevention and treatment strategies may both use similar techniques such as assertiveness, coping, and life skills training; efforts to build self-esteem and refusal skills; and group therapy.

Nonetheless, prevention and treatment efforts are targeted toward different populations and also may be distinguished by the focus of prevention on deterrence of use and the focus of treatment on recovery from abuse and its consequences. In contrast to prevention programs, substance abuse treatment programs are aimed at adolescents for whom psychoactive substance use has progressed past the stage of experimentation. Substance abuse treatment programs are usually geared toward older adolescents and include a variety of interventions designed to restore an individual to physical and mental health (267).

Adolescents seldom receive substance abuse treatment in age-specific settings. As likely as not, they can be found mixed into programs designed for adults or programs intended for children. There are few drug treatment programs specifically for adolescents, and the adolescent-specific drug treatment programs that do exist tend to serve a disproportionate share of the adolescents in treatment. Currently, only 18 percent of all drug treatment programs are adolescent-specific but nearly half of the adolescents in drug treatment are served by these programs (308,309). Adolescents in treatment for alcohol use problems are less likely to receive treatment in special adolescent programs; about 15 percent of adolescents being treated for alcohol use problems are treated in special adolescent programs. Almost one-fourth of adolescent alcohol treatment clients were in programs in which less than 10 percent of the client population were adolescents (211).

Self-Help Groups for Substance Abusers

Self-help groups for substance abusers often serve as alternatives or adjuncts to professional treatment, and many include programs not only for substance abusers but for family members as well. Self-help groups are widely used as a treatment of choice by many professionals and nonprofessionals and are frequently incorporated into professional substance abuse treatment programs (267). In this context,

Table 12-11—Overview of Substance Abuse Treatment Services for Adolescents

Service	Setting	Target population	Strategies
Assessment/referral	Community agencies: schools, medical settings, youth services agencies, juvenile justice, mental health settings	Substance users, to determine level of use/abuse and refer for treatment	Interviews, standardized tests
Treatment:			
Self-help groups	Community settings	Substance abusers, substance dependent (especially highly motivated, successful treatment completers)	Education, group support
Outpatient treatment	Mental health facilities, drug/alcohol treatment centers	Substance abusers, substance dependent (especially highly motivated, early abusers, with no prior treatment history)	Counseling, social skills development, psychotherapy group therapy, family therapy self-help
Residential treatment	Group homes, drug/alcohol treatment centers	Substance abusers, substance dependent (especially less motivated, prior treatment failures, limited support system)	Milieu therapy, education, group therapy, daily supervision, counseling, family therapy, self-help
Inpatient treatment	Hospitals (general, psychiatric, or specialized)	Substance dependent (especially less motivated, prior treatment failures, poor support system, medical risk, dually diagnosed)	Medical services, milieu therapy, psychotherapy, counseling, group therapy, family therapy, education, daily supervisions, self-help
Other	Schools, juvenile justice system	Students; adolescents arrested for delinquency offenses	Student assistance programs, diversion

SOURCE: Office of Technology Assessment, 1991.

self-help groups may serve as group therapy and/or aftercare.[83]

The oldest, largest, and best-known self-help group is Alcoholics Anonymous (AA), which was formed to help recovering alcoholics maintain their sobriety. As of 1986, AA included approximately 1.5 million participants (1). About 3 percent, or 47,000, were under the age of 20. In recent years, participation in AA by adolescents has been increasing, at least in part because of the inclusion of AA groups in formal treatment programs. Adolescents in their mid-to-late teens are likely to attend two or three meetings per week, slightly fewer than adults. Adolescent alcoholics are far more likely than adult alcoholics to also consider themselves addicted to other drugs (80 percent of AA members in their late teens, as compared with 30 percent age 40 or over).

Narcotics Anonymous—modeled after AA as a self-help group for narcotics abusers—indicates that its "fellowship" of participants is generally younger than that of AA, with most between the ages of 16 and 40 and approximately 10 percent under the age of 20. Informal estimates indicate that about 18,000 adolescents participate in Narcotics Anonymous meetings annually (199).

Although there are numerous formal and informal self-help groups in the substance abuse field, most use the 12-step model popularized by AA or some variation on it. This model regards substance dependence as a chronic illness from which recovery is an ongoing, lifetime process maintained solely by total abstinence. The program involves acceptance of the illness and one's powerlessness in relation to it; acknowledgement of the damage done by substance abuse; and commitments to make amends, continue the recovery effort, and help others. A strong spiritual, but nonsectarian, component is essential in the 12-step program. Whereas 12-step programs for adults have traditionally been voluntary, adolescents are often *required* to attend 12-step groups.

Peer support is a primary aspect of the self-help group approach. Most AA and Narcotics Anonymous groups include a "sponsor" system. Each recovering addict is paired with a more experienced partner (who, in the case of an adolescent, can be either a peer or an adult) available for crisis intervention and emotional support. The meeting format usually involves first-person accounts of drug and alcohol problems and recovery from them.

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[83] *Aftercare* refers to a variety of services designed to render assistance to an individual recovering from substance abuse following discharge from a hospital or formal treatment program, including such things as peer support and counseling, crisis services, job referral, or drop-in centers.

These inspirational testimonials help participants feel less alone in their recovery struggles.

AA and Narcotics Anonymous have traditionally been resistant to rigorous research studies, primarily as a means of protecting the confidentiality and anonymity of their membership. AA's own survey of its membership indicated that 67 percent of its members report having been sober for more than 1 year (1). Specific information regarding adolescent members is not available. Problems noted with the AA model include high attrition rates, apparently due to resistance to the spiritual component of AA (47). Although clinical descriptions of the use of the 12-step model with adolescents are available (e.g., 28), it is notable that outcome research is not available, despite the almost universal inclusion of these groups in formal adolescent treatment programs.

Outpatient Substance Abuse Treatment Programs for Adolescents

Outpatient substance abuse treatment programs are oriented around counseling rather than medical intervention. If a person needs medically managed detoxification, that is handled in another setting prior to the person's entry in the outpatient drug-free program. Outpatient substance abuse treatment programs seldom use medications on their clients.[84] Some outpatient substance abuse treatment programs are integrated into comprehensive youth service centers, family-planning services, or nutrition counseling (27).

The most intensive outpatient treatment programs are *day treatment programs*, in which the participant arrives early in the day and returns home only in the evening. Parental involvement is considered ''mandatory'' when available, in order to provide family support for continued participation by the adolescent. Day treatment programs function much like inpatient programs, with structured activities, onsite education, and a variety of therapeutic programs for adolescents and their families (131).

Outpatient substance abuse treatment programs often serve as early aftercare services for inpatients (16). Although some of these programs are available to low-income adolescents, they are frequently associated with private for-profit organizations, and can be quite costly—as much as $2,000 to $5,000 for outpatient day care (337). Community mental health centers also offer outpatient treatment as an alternative for low-income clients.[85] One estimate suggested that about 30 percent of such programs are associated with community mental health centers (134).

Residential Substance Abuse Treatment Programs for Adolescents

Residential substance abuse treatment programs for adolescents offer 24-hour supervision by trained adults and recovering peers, providing immediate confrontation of substance-abusing or other self-defeating behavior. Residential programs may have locked units, employ nursing and counseling staff very much like those in psychiatric hospitals, and include structured daily routines, including a variety of educational and therapeutic groups. They frequently operate on the 28-day model, with a high level of structure in the initial stages and diminished structure as the client earns privileges through program participation and responsibility.

Residential treatment programs remove participating adolescents from peer or family environments that may have encouraged or failed to prevent their substance abuse. Some observers argue that such removal not only limits the adolescent's access to drugs but also offers a positive environment in which the adolescent can deal with his or her substance abuse (207). Other observers, however, dispute this view, suggesting that adolescents in residential treatment are exposed adversely to more peers with problems (95). Unfortunately, research on the relative effectiveness of residential programs in comparison with other treatment options is not available to settle this issue.

Ideally, the *halfway house model* of residential treatment offers adolescent participants supervision coupled with participation in public school and extracurricular activities. Located in neighborhoods where residents can attend regular public schools, halfway houses are often staffed by a live-in couple who serve as "teaching parents." They usually include regularly scheduled group meetings focused on interpersonal relations and individual goals. Some are developed specifically as substance-abuse treatment settings, and others are simply homes for adolescents with any of a variety of problems—e.g., delinquency, emotional disturbance, homelessness.

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[84] Less than 8 percent of adolescent clients in outpatient substance abuse programs are on maintenance medication, and less than 3 percent are in detoxification programs (308,309).

[85] *Community mental health centers* are public or private nonprofit mental health clinics intended to serve the local residents of a community—generally on an outpatient basis. They are funded through a combination of fees, third party reimbursements, State and local government contracts, and Federal alcohol, drug abuse, and mental health block grants.

In the *therapeutic community model*, residents maintain the administrative and therapeutic functioning of the facility. Less emphasis is placed on specific forms of therapy and more on global changes in conduct, feelings, values, and attitudes (71). In therapeutic community settings, household responsibilities and privileges are often assigned based on seniority and success in the program, thereby providing motivation for individuals to continue their participation. Although this model has been used extensively with adult substance abusers, it is less commonly available for adolescents. Therapeutic communities can be highly confrontational and may be difficult environments for adolescents.

In *wilderness-challenge programs*, a group of adolescent clients and counselors live together in a "primitive" camp environment (274). Personal challenges include mastering unfamiliar environmental conditions and learning survival skills. Wilderness camps often operate on the therapeutic community model. Although information regarding the effectiveness of these models for *treatment* of adolescent substance abuse is quite limited, Tobler, in her meta-analysis of 143 adolescent drug *prevention* programs found alternative programs to be highly successful among disadvantaged and high risk adolescents (105,267,274).

A more recent type of residential program is the "*boot camp*" *or* "*shock incarceration*" concept for young offenders (adolescent delinquents). According to the Institute of Medicine, boot camps vary in nature: "Some are entirely militaristic environments with few if any therapeutic staff or procedures; others incorporate many drug treatment elements that the more successful prison treatment efforts display but lack still other requirements—particularly continuity of care when the individual returns to the community" (201). There have been no rigorous evaluations of the effectiveness of boot camps for drug-using offenders.

Inpatient Substance Abuse Treatment Programs for Adolescents

Hospital inpatient programs offering treatment for substance abuse include programs in independent facilities specializing in addiction, psychiatric hospitals, and general hospitals (85,201). Only a few States fund inpatient substance abuse programs (especially for alcohol abuse) specifically for adolescents (85). More than one-half of all adolescents treated for alcoholism are treated in settings serving primarily adults (308,309).

Adolescents in inpatient treatment settings often do not have the option of leaving. In 32 States, adolescents can be admitted for substance abuse treatment through "voluntary" commitment by their parents, with varying degrees of legal safeguards against inappropriate hospitalization.[86] Most inpatient facilities include locked-door units.

Hospitals generally include medically managed services, such as detoxification, as a part of treatment (131,203). In addition to medical services, hospitals generally offer therapy groups, individual therapy, and on-site educational facilities. These services are typically provided by an interdisciplinary staff. Family information and therapy programs are often available.

According to NDATUS, rehabilitation and recovery accounted for the largest percentage of inpatient adolescent care for alcoholism (89 percent) in 1989 (308,309). Five percent were in medical detoxification, 2 percent received social detoxification, and 4 percent were in custodial care. An adolescent receiving inpatient treatment for *alcoholism* had a 70-percent chance of being placed in a hospital, while an adolescent requiring inpatient *drug abuse* treatment was much more likely to be placed in a residential treatment facility (308,309). The standard length of stay for inpatient facilities has been 28 days for adults and slightly longer for adolescents. Adolescents are often assumed to need an even longer separation from their previous environment (193,267).

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[86] For a further discussion of this topic, see ch. 17, "Consent and Confidentiality in Adolescent Health Care Decisionmaking," in Vol. III.

Issues Related to Substance Abuse Treatment for Adolescents

Methodological Issues in Evaluation

Interpretation of research in the field of substance abuse treatment for adolescents has been hampered by a number of factors. Several investigators have reviewed relevant research literature between 1975 and 1988, resulting in the following conclusions:

- Evaluations too often fail to distinguish among age groups within adolescence or specify substances for which treatment is sought.
- Reliable measures of abuse, dependence or treatment success are not often used.
- Outcome research is limited, with poorly defined variables.
- Followup is rare and too brief.
- Research is often poorly designed, with insufficient attention to controls and comparison groups and factors associated with effectiveness.
- Definitions of terms need to be standardized (57,336).

Many programs report success rates only for those who complete treatment. Yet the attrition rate of clients (often as high as 50 percent, and sometimes as much as 90 percent) in a particular treatment program is in itself considered to be a valid practical criterion of program success (126). Methods and statistical procedures for dealing with clients lost to followup also vary, creating opportunities for significant bias.

Thus, despite the conclusion of some evaluators that adolescents who participate in treatment fare better than those who do not, these groups have not been systematically compared in long-term studies (134). Further research, utilizing clearer measures, stronger research designs, and a broader variety of adolescent patients, is badly needed. There is a significant gap in knowledge of treatment effectiveness in relation to adolescents, seriously hampering the development of appropriate public policy (201).

Some of the characteristics of clients and programs which have been examined with varying degrees of scientific rigor are presented below to illustrate the paucity of substantive data available in this area as well as to suggest directions for further research development.

Client Characteristics Related to the Effectiveness of Substance Abuse Treatment

Age—Laundergan, reporting on clients under age 25 in a private inpatient setting, found that younger clients were less likely to consider themselves "chemically dependent" and more likely to use drugs and alcohol at followup (164). This finding may be important when coupled with another finding that acceptance of chemical dependency is a significant predictor of adolescent treatment success (126).

In considering only residential clients, research has been contradictory regarding the effect of age on completion of a treatment program. One study found that adolescents overage 15 were more likely to complete treatment (94). One recent study found, however, that "relatively younger" clients were more likely to remain in treatment (103).

Ethnic Factors—Using race as an independent variable, some studies indicate higher rates of completion of treatment and reduction of drug use for white adolescents compared with nonwhites (238,248). Whites have also been found to be more likely than nonwhites to reduce posttreatment drug usage (103). Similarly, Jewish adolescents are more likely than others to complete a day-treatment program (94).

Pretreatment Behavior—Adolescents who initiate substance abuse early tend to experience more family discord and other problems, including resistance to authority,[87] and are less likely to complete treatment (94,126,238). Adolescents who have a history of educational failure or use multiple drugs are more likely to drop out of treatment (126).

Mental Health Problems—Although adolescents who are depressed are more likely to drop out of treatment, those with relatively severe psychopathology who do complete treatment seem to be more successful at reducing subsequent drug use (102,126). This interesting finding may reflect positive response to adjunctive treatment such as individual or group therapy.

Substance Abuse History—Specific substances used may be predictive of later treatment success.

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[87] A cause-and-effect relationship has not been determined.

One fairly consistent finding is that the two substances most commonly used by adolescents, alcohol and marijuana, are the most resistant to treatment (103,135,292). Findings are less definitive regarding other substances (57).

Program Characteristics Related to the Effectiveness of Substance Abuse Treatment

Setting—Comparisons of inpatient v. outpatient treatment offer no conclusive evidence that either setting is clearly more effective in reducing substance use. In the two largest national studies—the Drug Abuse Reporting Program (DARP) and the previously mentioned Treatment Outcome Prospective Study (TOPS)—comparisons of inpatient v. outpatient treatment resulted in contradictory results. Residential clients fared better in TOPS (135), while outpatients fared slightly better in the DARP study (248). These studies were both conducted with adult patients. A study using random assignment compared inpatient and outpatient services for juveniles characterized as delinquent and substance abusing and found improvement in both groups but no differences between groups (6). These researchers suggest that maturation, and not treatment, was responsible for change.

Time in Treatment—According to some studies, time in outpatient treatment for adolescents is negatively correlated with certain outcome measures, such as posttreatment productivity and frequent marijuana use (135,238). Hubbard looked at clients ages 17 and under and found that residential treatment was more successful for longer stays, but adolescents in outpatient treatment were more successful if their course of treatment was shorter (135). These findings were not true of 18- and 19-year-old adolescent clients. However, another study suggests that time in treatment positively correlates with posttreatment reductions in drug use (103).

Types of Services—Despite the emphasis in most programs on the addiction model, the services most clearly associated with positive treatment outcome are those often considered "adjunctive" to substance abuse treatment, such as educational, recreational, and family therapy services and social skills and assertiveness training. For example, a number of researchers suggest that recreational programs such as challenge-adventure courses are especially important because they teach adolescents alternative discretionary time activities as well as enhance self-esteem (102,103,126). Friedman and Glickman found that provision of educational services, mandated in residential programs, are an effective intervention in outpatient treatment as well (102).

Family involvement is also consistently found to be a positive influence upon program cooperation and treatment effectiveness—even more effective than individual therapy (22,53,94,102,260). One research team reports success in changing family relationships by intervening with only one family member (270). These findings may be particularly helpful, given that mothers were much more likely to be involved in their adolescents' treatment than fathers (126).

Program Climate—While counselors appear to be poor judges of their own success according to one study, their ratings of how explicitly they addressed clients' personal problems and feelings correlated with reduction in drug use (103). Other important correlates identified in this study were a practical orientation towards preparation for release from the program, measures of organization and order within the program, and adolescent client ratings of program flexibility.

Voluntary Participation—Mandated treatment is usually followed to completion, possibly because of legal sanctions, but voluntary treatment is more likely to be considered successful (71,23). An adolescent's perception of choice in treatment decisions is an effective predictor of treatment success.

The Economics of Substance Abuse Treatment

Substance abuse treatment for adolescents is generally expensive, though the range is substantial. Wright estimates the cost of a continuum of substance abuse care ranging from a primary prevention alcohol education program through medically intensive rehabilitation (337). According to Sunshine and Wright, a 1-month stay in a private hospital costs at least $4,000 to $5,000, may average around $10,000, and can be as high as $20,000 (267).

Publicly funded services are uniformly less expensive, with public hospitals costing between $1,000 and $6,000 per month (267). Day treatment is considerably less expensive than hospitalization—around $3,000 per month for a private for-profit program. Community mental health centers often provide outpatient services which cost clients only a few dollars, while the State reimburses the centers approximately $30 per hour of client services. There is no conclusive relationship between the cost and effectiveness of services (267).

Costs for most substance use treatment services can represent a considerable burden to adolescents, their families, and to those health insurance plans that cover such treatment. Medicaid coverage for substance abuse treatment services is limited, and[88] less than 20 percent of all treatment units serving primarily adolescents accept Medicaid coverage (308,309). Uninsured adolescents may seek treatment through community mental health centers or private nonprofit agencies, which often operate on a sliding-scale basis. Unfortunately, these agencies often report long waiting lists and limited staffing.

State expenditures for alcohol and drug treatment for persons of all ages exceeded $1.6 billion in 1988 (55). This represents a 61 percent increase over 1985. States provided funds to 6,926 treatment units in 1988. While almost one-half of adolescent alcohol clients received treatment in settings receiving some public support, adolescent drug abuse clients are served primarily in settings receiving no public support (308,309).

Utilization of Substance Abuse Treatment by Adolescents

According to data from NDATUS, the largest number of treatment programs are offered by private, nonprofit facilities (65 percent of the total). Utilization rates for these programs average 80 percent. Private, for-profit programs accounted for 14.4 percent of all programs surveyed by NDATUS in 1987 and served 11.9 percent of the total population in treatment (with an average 61-percent utilization rate). On the other hand, State and local governments own 17.3 percent of all treatment facilities, yet they serve 24.6 percent of the population in treatment, maintaining a utilization rate of almost 90 percent (308,309). These figures include adult facilities and adult utilization. Adolescent-specific figures are not available.

While not conclusive, these numbers at least suggest that available treatment may be underutilized in the private sector, creating a potential for overtreating—especially in private, for-profit settings. At the same time, some observers have suggested that adolescents who cannot afford private treatment may continue to be unserved, underserved, or inappropriately served (109,218).

Assessment and Referral of Adolescents With Substance Abuse Problems

The identification and referral of an adolescent with a substance abuse problem, although not technically substance abuse treatment per se, are usually the first steps in the treatment process. In most cases, the initial identification of an adolescent with a substance abuse problem is made by family and friends (126,134). In fact, however, other institutions or agencies—including schools, child welfare agencies, juvenile courts, mental health providers, medical settings, and community organizations—may be better informed and able to identify adolescents in need. The role of these other institutions and agencies in referring adolescents to assessment or treatment is crucial. And referral is not always a simple matter (see box 12-C). For this reason, emphasis has been placed in recent years on improving communications between treatment providers and these institutions.

The preliminary identification of an adolescent with a substance abuse problem is normally followed by more detailed assessment of the suspected substance use problem and the adolescent's need for particular services. Assessments can range from observation and interviews through the use of standardized tests to complete physical and psychological workups. A few assessment scales appropriate for adolescents have been developed, but the extent of their use is not known.[89] Schools and nonspecialized community agencies generally do not engage in elaborate assessment work themselves. They either rely on interviews and common testing procedures or refer an adolescent to a mental

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[88] See ch. 16, "Financial Access to Health Services," in Vol. III for discussion of public (e.g., Medicaid) and private third-party payment for substance abuse treatment services.

[89] One scale, the Adolescent Alcohol Involvement Scale, measures an adolescent's alcohol use only (179). Another scale, the adolescent-specific Addiction Severity Index, provides information regarding the severity of an adolescent's substance use problem as well as sociological and behavioral information related to family, employment, medical, and personality factors (87). Another scale is a two-part instrument developed by Winters and Henley to assess the extent and severity of chemical abuse (the Personal Experience With Chemicals Scale) and risk and maintenance factors (the Personal Experience Scale) (336). Some standard tests include indicators of substance abuse. One of the most frequently used diagnostic tests, the Minnesota Multiphasic Personality Inventory (MMPI), for example, includes a scale for substance abuse (the MacAndrews scale), which has been found to be a valid index for adolescents (229).

Box 12-C—Problems With Access to Substance Abuse Treatment Services in a Large Metropolitan Area

One large metropolitan area has at least eight different inpatient and residential substance abuse treatment facilities that serve adolescents. Seven of these facilities require health insurance payment. The eighth facility does offer an occasional "scholarship," but the criteria under which financial aid is available are unclear.

For low-income adolescents in need of substance abuse treatment who do not have health insurance, the only other substance abuse treatment services available in the area are outpatient services provided through community mental health centers. The nearest publicly funded inpatient substance abuse treatment facility is approximately 50 miles away, treats only females, and reports a long waiting list. Two nonprofit halfway houses are available, but these are most frequently used as aftercare or transitional facilities for adolescents who have already been hospitalized. They also report waiting lists. One of the private hospitals that claims a speciality in adolescent substance abuse treatment has a referral list for low-income youth, but fewer than one-quarter of the facilities on the list actually serve adolescents.

SOURCE: J. Emshoff and R. Margolin-Mankoff, "Treatment of Adolescent Substance Abuse: A National Review and Critique," paper prepared under contract to Carnegie Corporation of New York and the Carnegie Council on Adolescent Development, for the Office of Technology Assessment, U.S. Congress, Washington, DC, 1990.

health or substance abuse professional for assessment. Data provided by these interviews, however, have certain implicit difficulties in that some investigators have questioned the validity of such self-reporting. Researchers caution that assessment tests should be part of a battery of evaluation techniques that include intellectual and personality functioning, family relationships, and other areas (336). Comprehensive psychological assessment is especially important when dual diagnosis (diagnosis of psychiatric disorder in addition to substance abuse) is known or suspected, so that need for appropriate psychotherapeutic treatment is documented (186). NIDA recently developed a comprehensive assessment and referral manual for adolescents available for use and further testing (307a).

Once an assessment is done, the adolescent may be referred to a treatment program or service provider. This is the point at which decisions are made which affect patterns of utilization. Some of the more common formal sources of assessment and referral are examined below, followed by consideration of the need for standards for placement to guide treatment decisions (2).

Schools—Schools have a significant stake in the early identification and treatment of adolescent substance abusers. In 1984, 21 percent of school administrators surveyed nationally indicated that substance abuse problems ranked second only to discipline as a major problem (196). In addition, schools are where most adolescents spend a large part of their waking hours and, as discussed above, schools have been a primary site for drug prevention education.[90] Thus, these institutions provide convenient opportunities to observe behavioral changes which may be associated with substance use problems. Academic performance may suffer when an adolescent is using alcohol or drugs, and behavior also may begin to affect others if classroom disruption ensues. As a consequence, teachers and peers may be the first to recognize an emerging problem.

It is hardly surprising, then, that attempts have been made to develop school-based programs for identifying adolescent substance users and referring them to treatment. An example of a school-based program is substance abuse counseling—generally known as a Student Assistance Program. Student Assistance Programs are modeled on employee assistance programs (188,192). They provide on-site, immediate intervention—identifying students with problems, helping them to acknowledge their difficulties, and making referrals to other services in the community. In some cases, they use peer or guidance counselors already involved with other school programs. Student Assistance Programs often use prevention techniques and may reach out to students who are neither high risk nor active users. In many communities, Student Assistance Programs are among the only substance abuse intervention services available to low-income adolescents.

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[90] For discussions of school environments and their impact on health and of adolescents' use of discretionary time, see ch. 4, "Schools and Discretionary Time," in this volume.

Despite efforts like Student Assistance Programs, school systems are often reluctant to become involved in substance abuse issues which may be seen as health problems and not strictly educational concerns. In addition, policies requiring suspension for substance use may interfere with a school's ability to provide services onsite. Thus, one researcher argues that school personnel must make more effective use of community treatment resources, rather than attempting to provide long-range counseling themselves (341). Some States require schools to document efforts at coordination and to specify agency responsibilities before funding school-based substance abuse intervention programs. Confidentiality, coordination of services for multiproblem students, lack of parental involvement, and the advisability of increasing treatment services may be problems when schools become involved in identification and referral (275,341). The scarce literature on Student Assistance Programs (113) has not addressed these issues, but there have been reports of positive reception to Student Assistance Programs by students (188).

Juvenile Justice Agencies—The incidence of substance abuse problems among adolescents served by the juvenile justice system is disproportionately high (127).[91] Thus, the juvenile court can be an important link in connecting adolescents with substance abuse problems to needed treatment. Generally, services provided in court settings focus on assessment and referral for substance abuse treatment. However, in some instances the court may retain jurisdiction over a juvenile and actually approve a treatment plan in coordination with substance abuse or mental health agencies. This can occur under a diversion plan before adjudication is completed or afterwards, with treatment imposed as a condition of probation (sometimes with provision for expunging a record upon successful completion of treatment).

In diversion, the juvenile justice system (i.e., the court or a lower officer of the court) may redirect an adolescent to a substance abuse treatment program as an alternative to the adjudication process—reducing the caseload of the court system while providing rehabilitative services to adolescents (10). By retaining jurisdiction pending completion of a substance abuse program, a juvenile court may provide the added leverage of potential sanctions for noncompliance, thereby increasing cooperation with treatment (148). Although some authors have questioned the appropriateness of court-ordered treatment for substance abuse problems (258), others have shown that even mandated treatment can be effective when some measure of decisionmaking is available to the adolescent within the treatment program (104).

Treatment Alternatives to Street Crime is a Federal program that was developed for use in the adult corrections system in the 1960s but now funds programs for juvenile offenders as well (148). One comprehensive evaluation and referral program funded by Treatment Alternatives to Street Crime screens all juveniles involved in complaints for substance abuse (148). If initial screening reveals a substance use history, a more comprehensive assessment is done. Subsequent referral for treatment is then incorporated into conditions of probation.

The High-Intensity Treatment and Supervision program reported by Swann provides mandatory counseling not only for substance abusing delinquents but also for their parents (269). This program seeks to "empower" parents whose children are out of control by teaching parenting skills. Swann suggests that this program serves younger siblings in these families as much as the delinquents themselves (269).

Primary Health Care Services—Some observers have suggested that primary care physicians should evaluate adolescents for a variety of "risky behaviors," including substance abuse, at routine examinations (51,93). Although most physicians are willing to provide counseling and referral for adolescents with substance abuse problems, they are often quite poor in identifying drug users among other medical patients (255).[92]

NIDA's DAWN system, discussed earlier, documented 13,975 adolescents in 1988 who were admitted to selected emergency rooms nationwide for conditions involving the use of drugs. Most of these encounters (61.8 percent) were related to suicide attempts (302). While the use of a drug in a suicide attempt does not necessarily demonstrate the existence of a continuing substance abuse problem, the DAWN data do indicate that medical personnel come into contact with adolescents at crucial moments and that these opportunities for substance abuse treatment interventions are not being fully utilized. One review of an emergency department of a university hospital that was especially designated as an alternative to incarceration for public drunkenness suggests that intensive and longer term intervention at the emergency-room level may be effective in reducing episodes of intoxication (264). In this program, intoxicated adolescents were evaluated and observed closely for an extended period, interviewed extensively, and scheduled for followup appointments. At 13 months, only 13 percent of these high-risk patients had come back to the emergency department because they were intoxicated. The lack of a control group makes definitive conclusions about the effectiveness of this intervention difficult. However, since emergency room personnel rarely provide such interventions, specialized training in the provision of extensive counseling and followup seems warranted, and further systematic study of such interventions would be worthwhile.

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[91] The drug abuse and other health problems of adolescents in the juvenile justice system, as well as problems with the health services available to such adolescents, are discussed in ch. 13, "Delinquency: Prevention and Services," in this volume.

[92] For a fuller discussion of primary health care for adolescents, including, studies of physicians' ability to detect substance abuse problems in adolescents, see ch. 15, "Major Issues Pertaining to the Delivery of Primary and Comprehensive Health Services to Adolescents," in Vol. III.

Mental Health System—Considerable differences exist between professionals in the substance abuse and mental health areas, mostly centering upon appropriate identification of treatment needs and services. These differences have sometimes worked to the disadvantage of the adolescent seeking services. So, too, has the tendency in some areas to maintain separate substance abuse and mental health programs, even though certain clients may have dual diagnoses and therefore be denied needed treatment for one condition while enrolled in a program for the other.

Given the documented incidence of mental health problems in substance abusing adolescents, involvement by mental health providers is appropriate and necessary (102,126). However, these professionals need a basic knowledge of the substance abuse process and treatment to be most effective. In fact, a common complaint by substance abusers is that those in the mental health professions fail to recognize the severity of their problems (52). There is a divergence in perspective between traditional mental health professionals and those specializing in substance abuse treatment based on their respective philosophical frameworks. Mental health treatment frequently emphasizes development of self-control and searches for "underlying issues," while substance abuse treatment stresses loss of control over a substance and identifies the immediate symptom (the substance abuse) as the primary problem for treatment. In addition, traditional therapists may have difficulty with the spiritual focus of 12-step programs (52). While some mental health therapists are increasing acceptance and involvement with practitioners of the addiction model of substance abuse, others continue to develop psychologically oriented treatments especially focusing upon cognitive-behavioral and family approaches (52).

Standards for Placement of Adolescents With Substance Abuse Problems

The need for criteria to guide placement decisions for adolescents with substance abuse problems has arisen from the "dilemma of recommending the most appropriate treatment option from a proliferating array of choices" (131) and recent concerns about the potential overuse of both inpatient and outpatient treatment. In response, the substance abuse treatment community has developed its own placement standards, because the broad guidelines of the Joint Commission on Accreditation of Healthcare Organizations and the Commission on Accreditation of Rehabilitation Facilities do not offer sufficient assistance in admission decisions (64). The "Cleveland Criteria" were developed in 1986 by the Chemical Abuse Treatment Outcome Research (CATOR) network in collaboration with several treatment centers and advisers. These criteria offer standards for placement and treatment in six levels of substance abuse services and cover six levels of care, including separate guidelines for adolescent clients. Other work is being done by the National Association of Addiction Treatment Personnel (203). The Provisional Committee on Substance Abuse of the American Academy on Pediatrics has also developed guidelines for the selection of substance abuse treatment programs (2).

The emergent criteria stress placement in the least restrictive environment and seek to take adolescent maturation levels, cognitive functioning, and developmental factors into account in placement decisions. The National Association of Addiction Treatment Personnel's draft document suggests that placements should be based on clinical functioning rather than issues of sponsorship or payment.

Preliminary standards suggested by both the National Association of Addiction Treatment Personnel and the Cleveland group require a DSM-III-R diagnosis of a substance use or dependence disorder for a client to be considered for treatment (4). Placement decisions are also affected by medical, psychiatric, and "environmental" complications.

Interestingly, these criteria fail to address the issues raised by many experts in the field of substance abuse assessment. No mention is made of standardized instruments (beyond the criteria themselves) or of incorporation of assessment procedures into treatment planning. Furthermore, adherence to these criteria is, at this point, entirely voluntary and is not monitored at all.

Staffing of Substance Abuse Services

The credentialing of substance abuse treatment professionals is an enduring problem. Some level of standardization was recommended a decade ago, in a 1980 General Accounting Office report that called for a national system for accreditation of substance abuse counselors (279). That report noted that "counselor competency is vital to proper treatment" (279). Despite such recommendations, however, no nationally standardized system of accreditation has yet been developed.

The substance abuse treatment community has responded to this void by developing certification criteria of its own in several different fields. For example, the American Society of Addiction Medicine (ASAM) offers a certification examination to board-certified physicians with at least one year's full-time involvement in the field of alcoholism and other drug dependencies (3a).[93] The National Association of Alcoholism and Drug Abuse Counselors has developed certification criteria for National Certified Addiction Counselors (204).[94] All States now provide (and most require) some form of certification for substance abuse treatment professionals—usually identified as "certified alcohol counselor," "certified drug counselor," or a combined "certified addictions counselor"—and, as of 1989, 36 States extended reciprocity for certification. But, as discussed elsewhere in this Report, the number of health care providers trained specially to provide health care to adolescents is very small.[95]

Staffing patterns also affect the quality of care in adolescent substance abuse treatment programs and substance abuse treatment programs in general (201). Funding limitations may restrict staffing, especially in public settings. Administrative personnel report that in many cases, due to funding limitations, one staff member may provide several different services. Within drug treatment outpatient programs in which at least 75 percent of the clients are adolescents, there are approximately 20 clients per counselor. Each client has an average of only 1.7 scheduled appointments per week, including individual and group meetings (308,309).

In residential settings, psychiatrists or addiction specialists may provide individual therapy and paraprofessional staff provide milieu therapy and supervision of client activities. Inpatient programs are usually managed by physicians with training in psychiatry or addictions. Nonetheless, physicians may have limited contact with their clients, often meeting with them only for brief sessions and making decisions based on record reviews. Most hospitals use a team approach in which a variety of professionals share responsibility for patient care.

A complicating issue in evaluating staff requirements is the norm of hiring former substance abusers as counselors, especially in residential programs. In one study, about 40 percent of counselors in residential programs and nearly half in outpatient programs were described as recovering personnel (134). An assessment involving adolescent treatment found no differences in selected client outcomes between programs using staff who were former substance abusers and staff professionals with no personal substance abuse history.

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[93] ASAM is not itself a member of the American Board of Medical Specialties, and thus the ASAM certification process is not a board certification (3a).

[94] In order to be certified as a National Certified Addiction Counselor, applicants must possess current State certification or licensure as an alcoholism and/or drug abuse (AODA) counselor, have 3 years' full-time or 6,000 hours of supervised experience as an AODA counselor, 270 contact hours of education and training in AODA or related counseling subjects, and pass a written examination administered by the National Association of Alcoholism and Drug Abuse Counselors Certification Commission (204). The National Association of Alcoholism and Drug Abuse Counselors Certification Commission defines addiction as "the condition or state wherein an individual is physiologically and/or psychologically dependent upon alcohol and/or other drugs" (204).

[95] See ch. 15, "Major Issues in the Delivery of Primary and Comprehensive Health Services to Adolescents," in Vol. III.

The recent Institute of Medicine report on drug treatment did not deal in depth with the issue of staffing—and did not deal with staffing for facilities and programs treating adolescents at all— but, with respect to publicly funded treatment programs, it concluded in general that "the competence, quality, and continuity of care givers may well be a critical element in explaining. . .differential effectiveness" (201). Overall, the Institute of Medicine report recommended considerable upgrading of public facilities. With respect to private facilities, the Institute of Medicine suggested "the development of soundly derived standards for admission, care, and program performance" (201).

Conclusions About Substance Abuse Treatment Services for Adolescents

Clearly, there is no one system for the treatment of psychoactive substance use problems among U.S. adolescents. Costs of services vary tremendously by type of provider and setting. Adolescents from affluent homes or those with insurance coverage are likely to be seen in private settings that tend to offer more intensive services.[96] Low-income adolescents are typically restricted to what local public services may be available. Public services may vary tremendously from State to State, depending on the funds available for inpatient and outpatient services, policies regarding the mandating of substance abuse coverage in private health insurance plans, and the use of Medicaid funds to support substance abuse treatment.

The lack of standards and uniform definitions plague the field. Whether one considers quality of care standards, professional qualification standards, or key conceptual terms like "abuse," "need," or "success," confusion is more common than concurrence. Program accountability is affected when "success" is defined in terms of completion of treatment rather than in terms of short-term or longer term behavioral outcomes.

"Client-treatment matching" is described in the literature as an important reason for advancing research. However, it is questionable that more than one basic treatment exists with which individual client needs can be matched, because most treatment is based on the addiction model. Treatment for substance abuse seems quite uniform, with rather rigidly scheduled activities and little individualization. Furthermore, services are not currently differentiated as a function of the presenting problem, or the characteristics of the adolescent, the family, and the larger environment. Even when comprehensive assessments are undertaken, it is unclear how these data are used in program development.

Insufficient attention has been paid to whether adolescents should be considered a special treatment population in need of adolescent-specific treatment services, rather than continue incorporating adolescents into substance abuse treatment programs primarily intended for adults.

Similarly, insufficient attention has been paid to the special needs of minorities in both the delivery of services and the design of research efforts. Too often, data are not collected or analyzed on an ethnic-sensitive basis, so that little is known about what types of substance abuse treatment work best for which adolescent subpopulations.

Little attention has been paid to the differences among adolescents at different ages and stages of development. Adolescent programs, where they exist, tend to treat adolescents without much distinction between early, middle, or late adolescence. And adolescents with combined substance abuse and other problems such as mental retardation, mental illness, and delinquency may find themselves excluded from single-focus treatment programs because of their multiple diagnoses. Further exploration of the developmental stages of adolescence, the maturational process, and the unique needs of adolescents with dual-diagnoses is necessary so that treatment programs can be structured in ways that are responsive to the therapeutic needs of adolescents.

The need for increased funding for adolescent-specific substance abuse treatment services is accompanied by a comparable need in treatment and services system research. In too many treatment areas, research has yet to determine what works effectively and what does not. Research models which are specific to the characteristics of adolescents, different cultures, and substances need to be developed and rigorously tested with a variety of settings, providers, and clients if this deficit is to be addressed. Support by Federal agencies—particularly NIDA—for future research on adolescent substance abuse treatment, however, should require a strong commitment to methodological integrity and scientific evaluation.

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[96] Limitations on health insurance coverage for substance abuse treatment are discussed in ch. 16, "Financial Access to Health Services," in Vol. III.

Major Federal Policies and Programs Related to the Use and Abuse of Psychoactive Substances by Adolescents

Overview

The Federal role in the prevention and treatment of psychoactive substance abuse changed throughout the 1980s. Prior to 1980, the Federal Government had taken some direct role in funding prevention and treatment activities. In 1981, with the introduction of the Alcohol, Drug Abuse, and Mental Health (ADM) Block Grant Program of the Public Health Service Act, the bulk of Federal funds for prevention and treatment were given directly to the States in the form of block grants, and States were given primary responsibility for establishing program requirements and monitoring program activities (Public Law 97-35).[97] At the same time, the National Institute on Drug Abuse (NIDA) and the National Institute on Alcoholism and Alcohol Abuse (NIAAA) in DHHS continued to take the lead role in intramural and extramural *research* on alcohol and illicit drug abuse.

In 1986, in response to increased public and governmental concern about the spread of illicit drugs and drug-related crime, Congress and the executive branch joined together in strengthening the Federal role related to drug abuse, by passing the Anti-Drug Abuse Act of 1986 (Public Law 99-570). This law had provisions affecting the actions of numerous executive branch agencies, including the White House, the U.S. Department of Justice, the Federal Communications Commission, the U.S. Department of Defense, the U.S. Department of Education, the U.S. Department of Health and Human Services, the National Park Service in the U.S. Department of the Interior, and others. In 1988, Congress passed, and the President signed, another Anti-Drug Abuse Act (Public Law 100-690), further strengthening the Federal role in antidrug activities, and creating an executive branch office to coordinate national drug control policy. This executive branch office became known as the Office of National Drug Control Policy (ONDCP).

In both Anti-Drug Abuse Acts, substantial funds were authorized to be newly allocated to or reallocated within executive branch agencies for purposes of: strengthening Federal efforts to encourage foreign cooperation in eradicating illicit drug crops and in halting international drug traffic; improving enforcement of Federal drug laws and enhancing interdiction of illicit drug shipments; providing strong Federal leadership in establishing effective drug abuse prevention and education programs; expanding Federal support for drug abuse treatment and rehabilitation efforts; and for "other purposes" as delineated in the acts (Public Law 99-570, Public Law 100-690). ONDCP estimated the budget authority of the drug control agencies to have been $9.378 billion in fiscal year 1990 (327,327a). Forty-eight executive branch agencies, in 18 cabinet departments or independent agencies, were counted by ONCDP as being "national drug control program agencies" in February 1991 (327).[98]

With respect to adolescents, several features of the Anti-Drug Abuse Acts of 1986 and 1988 and subsequent executive branch activities are worth noting. As discussed above, alcohol and tobacco are the substances most likely to be used and abused by adolescents.[99] In contrast, both the 1986 and 1988

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[97] For further discussion of the Alcohol, Drug Abuse, and Mental Health Block Grant Program, see ch. 11, "Mental Health Problems: Prevention and Services," in this volume.

[98] According to ONDCP, 12 cabinet departments have agencies that are national drug control program agencies: U.S. Department of Justice, U.S. Department of the Treasury, U.S. Department of Transportation, the U.S. Department of Agriculture, the U.S. Department of the Interior, the U.S. Department of Health and Human Services, the U.S. Department of Education, the U.S. Department of State, the U.S. Department of Defense, the U.S. Department of Housing and Urban Development, the U.S. Department of Labor, and the U.S. Department of Veterans Affairs (327). Six independent agencies are national drug control program agencies: ONDCP, the U.S. Judiciary, ACTION, the Agency for International Development, the U.S. Information Agency, and the Central Intelligence Agency (327). In addition, according to ONDCP, the following budget accounts are part of the national drug control program budget: the Special Forfeiture Fund (ONDCP), the Asset Forfeiture Fund (U.S. Department of Justice), Support for Prisoners (U.S. Department of Justice), and Emergencies in the Diplomatic and Consular Service (U.S. Department of State) (327). As dictated by the law mandating the creation of ONDCP, national drug control program agencies were to be designated "jointly by the Director [ONCDP] and the head of the department or agency; or. . .by the President" (Public Law 100-690, Title I, Subtitle A, Sec. 1010). As explained further in the drug control budget submitted by ONDCP, not all activities of all the national drug control program agencies are earmarked for drug control activities.

[99] As discussed below, however, prevention activities funded by the Office for Substance Abuse Prevention (OSAP) in DHHS do include efforts to prevent or delay the use of alcohol and tobacco by adolescents and younger children, either because these are regarded as "gateway drugs" (see above) or because the use of these substances is illegal for most adolescents.

Anti-Drug Abuse Acts *emphasized* activities related to controlled substances (illicit drugs). Each act has some mention of activities related to alcohol abuse (e.g., drunk driving prevention programs under Title IX, Subtitle A, of Public Law 100-690), but such activities are not a leading focus of the laws. As perhaps the leading example of this focus on illicit drugs, the activities of ONCDP were legislated to include only those drugs included in section 102(6) of the Controlled Substances Act (21 U.S.C. 802(6)) (Public Law 100-690, Title I, Subtitle A, Sec. 1010); thus NIAAA is not considered a national drug control program agency. Neither act authorizes activities pertaining to tobacco use or dependence.[100]

Second, since the passage of the Anti-Drug Abuse Act of 1986, there has been continuing tension concerning the roles of the Federal Government relative to drug supply reduction and demand reduction. Supply reduction activities under the acts are more relevant to illicit drugs than to alcohol or tobacco, the substances most likely to be used by adolescents, so one would expect such activities to have a smaller immediate impact on adolescents in general than effective demand reduction activities. On the other hand, as noted above, one could argue that supply reduction activities are of primary importance in protecting adolescents from increasing quantities of—and growing illegal markets for—illicit drugs, and from the violence and other crime that is associated with the illicit drug market. In any event, approximately 70 percent or more of the budgets of the National Drug Control Agencies have been allocated to supply reduction activities, and this seems unlikely to change. Although, as described below, Federal investment in substance abuse prevention and treatment activities has grown throughout the 1980s, as a general matter, ONCDP continues to believe that the Federal Government should have a more limited role in activities related to reducing the *demand* for illicit drugs (defined in Public Law 100-690 as drug abuse education, prevention, treatment, research, and rehabilitation) than in activities related to reducing the *supply* of illicit drugs (defined in Public Law 100-690 as international drug control, foreign and domestic drug enforcement intelligence, interdiction, and domestic drug law enforcement, including law enforcement directed at drug users). ONCDP argues that "many supply reduction activities are intrinsically [Federal] Government operations. . .whereas most demand reduction efforts can and should be shared by our schools, churches, and communities" (327). Perhaps for this reason, the ONCDP national drug control strategy for fiscal year 1992 suggested some Federal pulling back from selected drug use prevention activities.

As noted above, it would be difficult to assess the impact of current illicit drug supply reduction activities on adolescents, and no such attempt is made here.[101] [102] This section provides a brief overview of the current leading executive branch activities in demand reduction activities (substance abuse research, prevention, and treatment) specific to adolescents. The two agencies with the largest role in reducing the demand for drugs among adolescents are the DHHS and the U.S. Department of Education. Other Federal agencies with smaller roles include ACTION, the U.S. Department of Uousing and Urban Development, and the U.S. Department of Labor.[103]

Specific Federal Agencies and Their Roles in Substance Abuse Prevention and Treatment for Adolescents

U.S. Department of Health and Human Services

DHHS has by far the largest role in adolescent-related demand reduction. The DHHS agency with the largest role is the Alcohol, Drug Abuse, and Mental Health Administration (ADAMHA), but other agencies such as the Centers for Disease

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[100] Each of the acts did have a particular focus on the susceptibility of *children and adolescents* to the use of drugs.

[101] ONCDP itself admits difficulty in evaluating the effectiveness of its supply reduction activities. According to ONCDP, data on drug availability, including domestic marijuana production, are "not yet available" (327).

[102] In March 1987, OTA published an analysis of Federal efforts in drug interdiction (stopping or reducing the amount of drugs coming across U.S. borders) (285a). The U.S. General Accounting Office has also analyzed Federal policies related to supply reduction/drug interdiction and has numerous publications on the issue (281).

[103] The U.S. Department of Transportation's efforts related to the reduction of driving under the influence of psychoactive substances are described in ch. 5, "Accidental Injuries: Prevention and Services," in this volume. The U.S. Department of Justice's activities related to substance use and sales by adolescent delinquents are described in ch. 13, "Delinquency: Prevention and Services," in this volume. Within DHHS, the National Cancer Institute provides most support for smoking prevention as part of its cancer prevention activities. These activities are discussed in ch. 6, "Chronic Physical Illnesses: Prevention and Services," in this volume, and in ch. 19, "The Role of Federal Agencies in Adolescent Health," in Vol. III.

Control (CDC), the Indian Health Service, the Office of Human Development Services, Health Resources and Services Administration, and the Office of Disease Prevention and Health Promotion, also play some role.

Alcohol, Drug Abuse, and Mental Health Administration Agencies—Four of ADAMHA's five agencies deal with substance use and abuse:

- the Office for Substance Abuse Prevention (OSAP),
- the Office for Treatment Improvement (OTI),
- the National Institute on Alcoholism and Alcohol Abuse (NIAAA), and
- the National Institute on Drug Abuse (NIDA).

OSAP and OTI are two relatively new ADAMHA agencies which fund program demonstration projects and other nonresearch activities. NIAAA and NIDA are research agencies.[104]

Office of Substance Abuse Prevention—OSAP was created by the Anti-Drug Abuse Act of 1986 (Public Law 99-570) as "the cornerstone of the Federal demand reduction strategy" and is "the major prevention unit of ADAMHA" (310). OSAP's programs are important to a consideration of substance use by adolescents, because, as dictated by the legislation that authorized the agency, a prime target group for OSAP programs is "high-risk youth."

Most of OSAP's prevention activities can be categorized as primary or secondary prevention, but some treatment demonstration projects are funded. Under its High-Risk Youth Demonstration Grants program, OSAP has funded the developing, testing, and evaluation of promising approaches for working with high-risk youth. OSAP's fiscal year 1990 budget was $193.4 million overall, approximately 30 percent of which was estimated to be spent on high-risk youth demonstration projects ($39.0 million) and community youth activities ($19.8 million) (327).

In its summary of national drug control program agency budget proposals for fiscal year 1992, ONDCP recommended increasing the budget for high-risk youth demonstration projects by about 8 percent over its fiscal year 1991 level (from $50.7 million to $54.8 million) and completely discontinuing the community youth activities program (327a, 327b).[105]

Office for Treatment Improvement—OTI was created in fiscal year 1990, and its long-term goal is to develop national prototypes for effective drug treatment policy. OTI's major responsibility, however, is to administer the ADM block grant, the drug and alcohol portion of which was $895.6 million in fiscal year 1990 (155a). Block grant funds are provided to States, and there is little requirement for State reporting. Thus, it is unclear what portion of ADM block grant funds are used for adolescents. A major OTI initiative directly relevant to adolescents has been a competitive grant program to assist States and communities in enhancing existing drug abuse treatment programs for critical population groups, including adolescents (defined as individuals up to age 22), racial and ethnic minorities, and residents of public housing projects. This grant project is not directed toward the development of new treatment approaches so much as the application of apparently promising modes of service delivery (for example, the use of aftercare services). For fiscal year 1991, $38.1 million was appropriated for the program on critical population groups, and a grants announcement was to be published in summer 1991 (327b).

National Institute on Alcoholism and Alcohol Abuse—NIAAA is not considered one of the national drug control program agencies (327,327a), but it funds and conducts research on the prevention and treatment of alcohol-related problems. NIAAA has three priority areas specific to adolescents: 1) defining sociocultural factors that promote adolescents' drinking, 2) developing and testing preventive interventions, and 3) assessing the impact of changes in the drinking age on alcohol consumption (270a,289a,289b). In fiscal year 1989, NIAAA spent over $6 million (under 5 percent) of its overall budget on activities aimed at adolescents. In fiscal year 1991, NIAAA funded an Adolescent Alcohol Research Center.

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[104] NIAAA and NIDA do conduct research on the effectiveness of particular substance abuse prevention and treatment programs, but more of their focus is on research on the epidemiology, risk factors, and effects of drugs and alcohol. When projects involving intervention are funded by NIAAA and NIDA, they are required to have a more rigorous research design than that required for OSAP and OTI projects (304a). Depending on the results of the OSAP and OTI project evaluations, some projects can be expected to be subjected eventually to the rigors of controlled trials (311a).

[105] The community youth activities program is a combined block grant ($4.9 million in fiscal year 1991), State demonstration grant ($14.2 million in fiscal year 1991), and Projects of National Significance ($1.1 million in fiscal year 1991) program to provide funds for after-school, vacation, and weekend activities for dropouts and in-school youth (Public Law 100-690). As this Report was being prepared for publication, it was not clear whether Congress would grant to ONDCP's request to discontinue funding for the community youth activities program.

National Institute on Drug Abuse—NIDA supports research on use and abuse of illicit drugs (e.g., marijuana, cocaine, PCP), although it also supports some research on tobacco use and on the combined use of alcohol and other drugs. In the late 1980s and early 1990s, NIDA received considerable increases in its overall budget; NIDA's overall budget for fiscal year 1990 was $379 million; its estimated budget authority in fiscal year 1991 was $428.3 million (327).

Many of NIDA's current projects are related to the prevention or treatment of substance use by adolescents, but NIDA could not estimate for OTA what proportion of its overall budget would be spent on projects involving adolescents ages 10 to 18 (304a). OTA's review of material submitted by NIDA in 1989 suggested that most of NIDA's adolescent-related projects focus on prevention, and that very few current projects were investigating new treatment approaches for adolescent substance users (304a). In 1991, ONDCP said that the administration was placing a high priority on research on drug abuse treatment for adolescents, which it characterized as "perhaps the least researched aspect of the field" (327), and NIDA has initiated a large-scale study of the effectiveness of drug treatment for adolescents, with long-term followup of clients (327). NIDA has also begun to devote more grant funds to the investigation of risk factors for drug abuse among inner-city minority adolescents.

Other DHHS Agencies—Within *CDC*, the Center for Chronic Disease Prevention and Health Promotion's Office on Smoking and Health is the lead Federal agency on tobacco and health (320a). CDC's new Division of Adolescent and School Health has the prevention of HIV and AIDS as its major emphasis, but it has also focused on other health-compromising behaviors by adolescents, including psychoactive substance use. The major activity in this respect is the development of a Youth Risk Behavior Surveillance System (YRBSS), which will periodically question adolescents about their engagement in a range of health-compromising behaviors, including substance use.

American Indian and Alaska Native adolescents are more likely than many other adolescents to use alcohol and illicit drugs (286). In addition, they are very likely to live in communities in which alcohol abuse is almost epidemic (284). Yet a focus on Indian adolescent substance use was long in coming in the *Indian Health Service*, the major health service agency for Indians (286). The 1986 Anti-Drug Abuse Act provided funds to be used for substance abuse prevention and outpatient and residential treatment of Indian adolescents, and in 1988, the Indian Health Service reported a commitment to providing services to all Indian adolescents diagnosed with a substance abuse problem (286,327a).[106] According to ONDCP, eight Adolescent Regional Treatment Centers were to be established by the end of fiscal year 1991, an increase of one over fiscal year 1990 (327a).

The *Office of Human Development Services'* Administration for Children, Youth, and Families funds two grant programs related to adolescent drug use (327a,327b). One is the Drug Abuse Prevention Program for Runaway and Homeless Youth, which awards grants to public and private nonprofit agencies, organizations, and institutions to carry out research, demonstration, counseling and services to runaway youth and their families, and for other activities (327b). The other is the Youth Gang Drug Prevention Program, which provides grants to projects designed to prevent the participation of adolescents in gangs that engage in illicit drug-related activities, and for other purposes (327b). Each of these programs had $14.8 million to carry out existing grants in each of fiscal years 1990 and 1991, and level funding was requested for fiscal year 1992 (327b).

Except for its role in administering the maternal and child health services block grant,[107] the Bureau of Maternal and Child Health in the *Health Resources and Services Administration* has no direct role in substance abuse prevention and treatment for adolescents. The Bureau does participate in a number of formal and ad hoc interagency coordinating activities, however (319a).

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[106] The Bureau of Indian Affairs (BIA) in the U.S. Department of the Interior also has a role in adolescent substance use prevention and treatment through drug education in BIA-supported schools and detention and diversion of Indian adolescents who become involved with Indian juvenile justice programs because of alcohol and other drug use (286,327a,327b).

[107] See ch. 19, "The Role of Federal Agencies in Adolescent Health," in Vol. III for additional information on the maternal and child health services block grant.

The *Office of Disease Prevention and Health Promotion (ODPHP)* in the Office of the Assistant Secretary of Health has a general focus on "high-risk youth and reducing high-risk behavior" and has supported a number of efforts to help improve adolescent health (320a). These include initiating the interagency Ad Hoc School Health Committee, funding a marketing study of adolescent high risk behaviors, and developing publications related to school health programs (320a). ODPHP also oversees the development of the health objectives for the nation (e.g., Year 2000 National Health Objectives). Objectives related to reducing adolescents' use of tobacco, alcohol, and other drugs are included in the objectives (320b).

U.S. Department of Education

The U.S. Department of Education was required to get involved in drug abuse prevention with the passage of the Anti-Drug Abuse Act in 1986 (Public Law 99-570). By 1989, the Department had developed a three-pronged approach to the drug problem, involving 1) the provision of leadership, 2) the dissemination of information, and 3) the provision of technical and financial assistance to States (57a).

The most prominent U.S. Department of Education activity related to adolescent substance use has been the promotion of drug-free schools and communities, pursuant to the mandate of the Drug-Free Schools and Communities Act (Public Law 99-570). This legislation, which was enacted as part of the 1986 Anti-Drug Abuse Act and reenacted in 1988 with the Augustus F. Hawkins-Robert T. Stafford Elementary and Secondary School Improvement Amendments of 1988 (Public Law 100-297), supports State and local programs of drug abuse prevention and education. It was subsequently amended at the end of the first session of the 101st Congress to require schools to adopt firm drug policies as a condition of eligibility for Federal funds (Drug-Free Schools and Communities Act Amendments of 1989 [Public Law 101-226]). Other adolescent-related grant programs in the U.S. Department of Education include demonstration grants to institutes of higher education, an emergency grants program to local educational agencies that demonstrate a significant need for additional assistance in combating drug and alcohol use, a school personnel training program, a counselor training grant program, a Federal activities grants program, and regional centers for drug-free schools and communities (327b).

In fiscal year 1990, approximately $435.9 million in formula grants (based on the number of elementary and secondary school students (in the State) was distributed to States under the Drug-Free Schools and Communities Act local grants program; in fiscal year 1991, the amount was $497.7 million (327b). No increase was requested for fiscal year 1992 (327b). Neither were increases requested for any of the other Department of Education programs except for the emergency grants program (from $24.3 million to $49.5 million) (327b).[108]

Other Federal Agencies

ACTION, the Federal agency that coordinates volunteer activities, has taken an increasing role in the drug war (327a). The ACTION program most directly related to efforts to reduce adolescent drug use is the Drug Alliance grant program (54 FR 173, 1989). In fiscal year 1991, this program was to provide grants of up to $40,000 (with a requirement for a 50-percent non-Federal match) for projects that use nonstipended volunteers to provide positive peer activities for youth serve as mentors for high-risk youth, and other services (327b). In the program announcement, ACTION cited increasing acceptance of the notion of " 'immunization'—that voluntary service may in fact reduce the risk of drug involvement among participating youth by reinforcing good work habits, helping enhance self-esteem, establishing a sense of belonging within the community, and providing positive role models" (54 FR 173, 1989). Applicants, who must be private nonprofit incorporated organizations or public agencies, must adhere to "a strict policy of the nonuse of illicit drugs" and not endorse a philosophy or any activities that would advocate "the tolerance of the initial or responsible use of any illicit drug, or the illicit use of any legal drug" (54 FR 173, 1989).

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[108] The emergency grants program provides assistance to local educational agencies that demonstrate a significant need for additional assistance in combating drug and alcohol use. Districts compete for funding to support a comprehensive range of services, including educational programs, counseling programs, enhancement of school security, afterschool programs, programs for parents and other community outreach efforts, and alternative programs for students with a history of drug abuse or others who are difficult to reach in the regular school setting (327b). ONDCP estimated that 50 awards would be made under this program, ranging from $100,000 to $1 million (327b).

Budget authority for the Drug Alliance grants was $1.3 million in fiscal year 1990, and $2.2 million in fiscal year 1991 (327a). The administration requested a reduction in funding to $1.5 million for fiscal year 1992.

In fiscal year 1991, the *U.S. Department of Housing and Urban Development* was to provide $7.5 million in financial assistance for the creation and implementation of Youth Sports Programs in public and Indian housing (327b). Individual grants were to be for a maximum of $125,000 and would require a 50 percent match by the applicant (327b). No funds were requested by the Administration for this program for fiscal year 1992 (327a,327b).

Adolescent drug use is addressed to some extent by *U.S. Department of Labor*-funded programs such as:

- Job Corps—drug tests for applicants, drug education, and treatment for enrollees;
- Youth Opportunity Unlimited (YOU) program—drug eradication control is one part of the provision of coordinated, comprehensive services for all youth in six funded communities.

ONDCP estimates that $9.5 million was spent on drug control activities in the Job Corps in fiscal year 1991, and $6.0 million for the YOU program in fiscal year 1991. A substantial increase (to $25 million) was requested for YOU for fiscal year 1992 (327b).

Issues in Federal Programs and Policies Related to the Use and Abuse of Psychoactive Substances

Clearly, numerous resources are being applied to the drug problem among adolescents. It is unclear, however, whether the infusion of resources is being targeted appropriately. Much of the Federal money on prevention being given to States is provided with little requirement for evaluation (280). In turn, because few evaluation data are available, States often have little idea of how best to use available funding (281). Audiovisual materials, for example, are often not evaluated before being sent out for use by local school districts, and it is unclear whether the materials are being used (265a). OSAP is attempting to evaluate materials, but it does not have rigorous research requirements.

Available curricula for substance abuse education may be inappropriate. So-called "model curricula" developed by the U.S. Department of Education have been criticized as being inappropriate to the needs of urban schools in multicultural settings (180). On the other hand, States that believe they have an effective approach to prevention have pointed out that the amount available from the Federal Government is insufficient. The cost of putting one substance abuse counselor in every middle school in the country, for example, was estimated at $400 million in 1989, more than the entire Drug-Free Schools and Communities Act authorization in fiscal year 1988 (265a). Almost $500 million was appropriated for Drug-Free Schools and Communities Act programs in fiscal year 1991, but it was to be used for drug abuse education as well as early intervention (327b). About $3.4 million was authorized for counselor training grants, and $20 million for school personnel training grants, in fiscal year 1991, but no funds were allocated to actually placing counseling services in schools (327b).

Some charge that funding has not been targeted to high-risk areas (180). The U.S. Conference of Mayors has criticized the channeling of Federal money through block grants to States. The mayors argue that it is their neighborhoods, police officers, and children who are most under siege (246). The Nation's governors, on the other hand, support the use of State block grants, arguing that direct money to cities "would present an uncoordinated method that could only serve to displace drug trafficking rather than dismantle entire operations" (246).

It is further unclear whether national drug control efforts are targeted toward the substances that are most often used, and perhaps abused, by adolescents. The national drug control strategy has been criticized for its relative lack of attention to problems of alcohol abuse among adolescents (180). Tobacco is the substance used most often by adolescents, but justification for studying tobacco-related risk factors or attempting to reduce its use among adolescents must often be justified by the notion that tobacco is a "gateway drug."

Although very little adolescent-specific information is known about the effects of drugs such as marijuana and cocaine, NIDA and NIAAA are devoting only minimal funding to encourage research on the consequences of psychoactive substance use by adolescents. Support for research on treatment for adolescents who abuse substances is beginning to increase. It appears that after several years of increases in funding, support for some types of drug prevention activities may be leveling off or declining (327a,327b).

Conclusions and Policy Implications

Adolescents' use, and possibly problem use, of psychoactive substances has been of great public concern. This chapter suggests that adolescents' use of substances that are legally available to adults—i.e., alcohol and nicotine—is more prevalent than their use of illicit drugs. One-third of high school seniors report having had five or more alcoholic drinks in a row during a 2-week period. Almost 19 percent of high school seniors report smoking at least some portion of a cigarette daily. Using daily use of illicit drugs as an indicator of problem use, between 0.3 and 3 percent of adolescents nationwide would appear to have a serious drug problem.[109] Some local surveys and studies of homeless and incarcerated adolescents, however, have found evidence of more extensive illicit drug use. Further, daily use is not the only indicator of problem use; CDC has found that 5 percent of students in grades 9 through 12 in Washington, DC, reported using needles to inject illicit drugs at least once, possibly putting themselves at risk of overdoses, addiction, and HIV and other infections.

Extensive financial and human resources are being applied to *preventing* psychoactive substance use among adolescents, but it is unclear whether the infusion of resources is being designed or targeted appropriately. For example, more information is needed about how many adolescents use substances in ways that cause problems and interfere with optimal development. Fortunately, additional Federal resources are being put into understanding the extent of, and risk and protective factors for, substance use among adolescents now believed to be at particularly high risk (e.g., inner-city, low-income adolescents). However, recent evidence that suggests that excessive substance use (as opposed to occasional use or nonproblem use of drugs) may be the result, rather than the cause, of other psychological problems suggests that considerable attention should be given to assessing mental health status as a risk factor, and attempting to prevent excessive drug use through early treatment of poor psychological adjustment.

Is Prevention Effective?

Assessments of the effectiveness of psychoactive substance use prevention efforts have been limited by methodological shortcomings in most of the evaluations. This situation is unlikely to change soon because Federal agencies that support preventive interventions (e.g., OSAP, U.S. Department of Education, Indian Health Service) often do not require scientifically rigorous evaluations.

The substance use prevention programs that have been evaluated relatively rigorously show relatively little change in adolescents' use of substances, even using self-report measures. The generally unremarkable results of primary prevention programs do not necessarily imply, however, that such programs should be discontinued. Both the rigorously evaluated and not so rigorously evaluated programs may achieve other goals for adolescents, for example:

1) improvements in their social competence, including their ability to make decisions, refuse unwanted peer pressure, and otherwise have rational discussions with their peers and others;
2) improvements in their self-understanding; and
3) improvements in their knowledge about a range of psychoactive substances and possible physiological and developmental effects.

The extent to which substance use prevention programs achieve some or all of these goals is largely unknown, because outcomes other than reductions in use have not usually been measured. The danger is that programs taking more broad-based approaches may be discontinued eventually if they do not show marked reductions in use.

What About Treatment?

Some adolescents are problem users of alcohol and/or other psychoactive substances and require some form of treatment. However, numerous questions remain about treatment for substance-using adolescents. For example, although instruments are under development, there is currently no valid way to assess which adolescents need treatment specifically related to their substance use. There is very little research on new treatments for adolescents or regular data collection on the effectiveness of what is being provided.

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[109] A total of 0.3 percent of high school seniors reported using cocaine (all forms) 20 or more times in the month preceding the 1989 High School Seniors/Monitoring the Future Survey; 2.9 percent of high school seniors reporting using marijuana or hashish 20 or more times in the month preceding the 1989 survey. No other survey found higher "daily" use of marijuana, but other surveys found that daily use of cocaine was higher (e.g., the National PRIDE survey found that an average of 0.6 percent of senior high school students reported daily use of cocaine).

Evidence suggesting that some placements are inappropriate includes data derived from NDATUS that private treatment centers appear to be underutilized, while public facilities are almost always at capacity. In addition, twice as many adolescents (49,000 on the day the most recent NDATUS was taken) were estimated to be in treatment for the use of drugs other than alcohol, despite the fact that alcohol is much more widely used among adolescents. Adolescent clients being treated for use of drugs other than alcohol are served primarily in private for-profit and not-for-profit settings. These data suggest that financial considerations may be driving placement decisions, but additional investigation on this point is needed. This issue is difficult to investigate rigorously precisely because of the lack of definitions of problem use among adolescents.

Less restrictive treatments, which might be sought out by adolescents themselves, are often unavailable. All but five States and the District of Columbia have statutes specifically authorizing at least some adolescents[110] to receive drug- and/or alcohol-related health services without parental permission[111], but gaining access to such services may be a problem. Only 17 percent of employees in medium and large firms who were covered by private insurance had coverage for outpatient substance abuse treatment that was the same as that for treatment of other illnesses.[112] Medicaid payment for substance abuse treatment is not required by Federal law. Few school-linked health centers are in existence; in any event, these tend not to deliver many services or make many referrals for substance use problems.[113] There is considerable enthusiasm for the early intervention programs known as Student Assistance Programs (based on the workplace-based Employee Assistance Program model), but there is as yet no evidence as to their availability or effectiveness. In 1987, 272,000 adolescents ages 10 to 18 were estimated to have had any treatment for substance use problems.

Some barriers to treatment are due in part to the fact that there is very little evidence on the effectiveness of contemporary approaches to substance abuse treatment for adolescents, and considerable concern about a number of features of the contemporary treatment system. Of greatest concern is that the centerpiece of the treatment approach for adolescents is the same as that for adults: the addiction model, which requires thinking of oneself as a lifetime addict who will never be able to control the use of any psychoactive substances. This approach may or may not be appropriate for adolescents, who are still developing a sense of themselves. Evidence concerning risk factors for problem use of substances, and the prevalence of psychiatric comorbidities in adolescent patients, suggests that greater emphasis on adolescents' mental health needs than on the addiction model may be beneficial.

There is concern as well about the training and credentials of substance abuse treatment personnel. Treatment in substance abuse treatment facilities tends to be delivered by recovering drug abusers, who may not be the most effective models for adolescents. However, the ability of mental health professionals and primary care physicians to both recognize and treat substance abuse problems has not been demonstrated, and the little research that has investigated the issue suggests the "recovering" personnel are as effective as health care professionals.

Certain features of substance abuse treatment modalities have been found to increase success rates, although definitive conclusions are limited because of a scarcity of methodological rigor.[114] Apparently successful features include parental involvement and adolescents' perceptions of choice in treatment decisions, including the decision to seek treatment. Also, despite the emphasis in most programs on the addiction model, the services most clearly associated with positive treatment outcomes are those often considered "adjunctive" to substance abuse treatment: educational and recreational services and social skills and assertiveness training. There is no definitive research on whether outpatient or inpatient treatment is more effective.

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[110] Some States have placed age restrictions for allowing minors who are age 12 and over, or age 16 and over, to consent to such services.

[111] See ch. 17, "Consent and Confidentiality in Adolescent Health Care Decisionmaking," in Vol. III.

[112] See ch. 16, "Financial Access to Health Services," in Vol III.

[113] See ch. 15, "Major Issues in the Delivery of Primary and Comprehensive Services to Adolescents," in Vol. III.

[114] For example, program success may be defined as mere completion of a scheduled treatment program. When other outcomes are used, clients who leave before their scheduled treatment is complete are often not counted as part of the evaluation. Outcome measures are often not comparable across studies and no-treatment comparison groups are rarely used.

The overall lack of effectiveness data and the preliminary evidence concerning the relative effectiveness of voluntary treatment are especially troubling in light of the fact that in 32 States adolescents can be admitted under "voluntary" commitment status by their parents, with no legal recourse to contest this status.

Research

Much additional research is needed on psychoactive substance use and abuse among adolescents. Given current data, it is impossible to determine the number of adolescents using such substances or the number for whom substance use is a problem. Conclusions about the effectiveness of prevention efforts can be only preliminary at this point, and it is therefore impossible to say whether resources are being wasted. An in-depth look at the effectiveness of drug abuse prevention interventions currently being funded seems warranted. The bulk of prevention efforts have focused on prevention of any and all substance use by adolescents, and disturbed adolescents who may be in greatest need of intervention may be getting neglected. The number of adolescents in need of treatment, the numbers in treatment, and whether such treatment is appropriate and effective are not known. There has been until recently very little Federal support for research on treatment effectiveness.

As noted here and in other chapters in this report, there are considerable barriers to access to health services for those adolescents who feel themselves to be in need of them. Specific policy options related to alcohol, tobacco, and illicit drug abuse by adolescents are listed in Volume I.

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PREVENTION AND SERVICES RELATED TO DELINQUENCY AND HOMELESSNESS

Chapter 13

DELINQUENCY: PREVENTION AND SERVICES

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Chapter 13

DELINQUENCY: PREVENTION AND SERVICES

Introduction

Delinquent behavior among U.S. adolescents has recently received a great deal of public attention (24,272,301,398a,399,463). Many of the popular accounts of adolescent delinquency focus on serious violent offenses against persons, including the kinds of violent acts that prompted the U.S. Surgeon General in 1985 to label violence a major public health problem (406).

Violent behavior by adolescents sometimes results in injury or death, and children and adolescents who observe violent behavior may experience emotional trauma (38).[1] It is important to note, however, that the primary victims of violence by other adolescents and by other individuals are adolescents (423). The U.S. Surgeon General's report identified violence as a major cause of injury and death among young people. Furthermore, it called for increased efforts on the part of health professionals to prevent violence in order to reduce its attendant morbidity and mortality (406).

But most delinquent acts by U.S. adolescents are not violent ones, and some people believe that delinquency can be considered an adolescent health problem for reasons other than the injuries and deaths associated with violence. Such reasons include the following:

- Delinquent behavior by adolescents has been associated with their engaging in health-threatening activities, such as alcohol, tobacco, and drug abuse, risky driving behavior, and precocious sexual experimentation.[2]
- Delinquency and the psychiatric diagnosis of conduct disorder[3] are characterized by many of the same behavioral features.[4] A set of behaviors that might result in one adolescent's being diagnosed with "conduct disorder" and directed to the mental health system for treatment might lead to another adolescent's being labeled "delinquent" and referred to the juvenile court for punishment and/or rehabilitation.
- Adolescents held in juvenile detention and correctional facilities tend to have serious unattended health problems—before, during, and after their commitment to such facilities.[5]

This chapter examines the problem of adolescent delinquency. The first section of the chapter is devoted to background information on delinquency among adolescents. Subsequent sections deal with primary and secondary prevention efforts, services for adolescent offenders within the juvenile justice system, and major Federal policies and programs pertaining to delinquency. The chapter ends with conclusions and policy implications.

Background on Adolescent Delinquency

Despite intense societal interest in adolescent delinquency, accurate knowledge about the incidence, prevalence, causes, and consequences of adolescent delinquency is limited. This section discusses what is known about these factors. Definitional issues and limitations in data that confound analyses of delinquency are discussed below. Also discussed below are demographic and other factors associated with delinquency and information on the consequences of delinquency.

Definitional Issues

The study of adolescent delinquency has been plagued by semantic and definitional problems that confound research design and the interpretation of data. Definitions of some of the terms used in the discussion in this chapter are provided in box 13-A.

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[1] Early research indicates that exposure to violence hinders the emotional and intellectual development of children exposed to violence (38).

[2] For further discussion, see "Covariation of Adolescent Health Problems," prepared for OTA by D. Wayne Osgood and Janet K. Wilson (304).

[3] *Conduct disorder* is defined in the *Diagnostic and Statistical Manual of Mental Disorders*, 3rd ed., revised (DSM-III-R) as a "persistent pattern of conduct in which the basic rights of others and major age-appropriate societal norms or rules are violated" (10).

[4] Some acts (e.g., stealing) can be characterized both as delinquent acts and as symptoms of conduct disorder. Conduct disorder is characterized by a pattern of behavior over time; an isolated act of delinquency, therefore, would not constitute a "pattern" necessarily leading to a diagnosis of conduct disorder. Conversely, not all behaviors included as symptoms of conduct disorder are delinquent behaviors; lying, for example, is a criterion for a diagnosis of conduct disorder, but in most circumstances it is not a legal offense.

[5] A discussion of health problems within the juvenile justice system is presented below.

Box 13-A—Definitions That Pertain to Adolescent Delinquency

Adjudicated: Passed on judicially, settled, or decreed, or convicted and sentenced. An adjudicated case is one in which the court has entered a judgment.

Adolescent delinquency: For purposes of this chapter, offenses committed by adolescents that would be considered violations of criminal law if committed by adults (ranging from minor offenses such as simple assault to serious offenses such as larceny-theft or aggravated assault) and offenses committed by adolescents that are considered offenses only because they are committed by a minor (i.e., "status offenses" such as running away from home, truancy).

Aggravated assault: The unlawful intentional attempt to inflict or actual infliction of serious bodily injury or death by means of a deadly or dangerous weapon.[1]

Antisocial behaviors by children: Also known as conduct problems in the criminology literature, these are hostile or harmful behaviors that deviate from the social norm (e.g., aggression, stealing, lying, fighting).

Arrest rate: The number of arrests made in a given population per some population base during a given time period (e.g., 5 arrests per 100,000 population). An arrest rate is a type of incidence rate.

Arson: Any willful or malicious burning or attempt to burn, with or without intent to defraud, a dwelling house, public building, motor vehicle, aircraft, personal property of another, etc.[1]

Attention deficit hyperactivity disorder (ADHD): A mental disorder defined in the *Diagnostic and Statistical Manual of Mental Disorders*, 3rd ed., revised (DSM-III-R) as a disturbance lasting at least 6 months that is characterized by developmentally inappropriate degrees of inattention, impulsiveness, and hyperactivity. Onset of the disorder, which is more common in males than females, is typically before the age of 4. Central nervous system abnormalities are thought to be predisposing factors. Some impairment in schoolwork or cooperating in group social activities is common.

Burglary/breaking or entering: The unlawful entry of a house or structure to commit a felony or a theft. Attempted forcible entry (e.g., by breaking a window) is included.[1]

Career criminals: High rate or long duration offenders who contribute most to total crime rates.

Conduct disorder: A mental disorder defined in DSM-III-R as a disturbance lasting at least 6 months in which a young person persistently violates basic rights of others and violates major age-appropriate societal norms. The diagnosis is made when an individual displays at least 3 of 13 specified behaviors (e.g., stealing, running away, frequent lying, deliberate fire-setting, frequent truancy, breaking into someone else's property, deliberately destroying property, being physically cruel to animals, using a weapon in more than one fight). Onset is usually prepubertal. Predisposing factors are thought to include ADHD, parental rejection, absence of father, early institutional living, and association with a delinquent subgroup. Complications include school suspension, legal difficulties, and psychoactive substance use.

Cross-sectional studies: In criminology research, studies that compare individuals involved in offending behavior with those who do not commit offenses at one point in time. Some studies may be broader and, for example, compare families of very delinquent children with those of not-so-delinquent children.

Delinquent adolescents: Adolescent juvenile offenders.

Demographic factors: Age, gender, race, ethnicity, geographic location, and socioeconomic status are typically defined as demographic factors.

Drug abuse violations: State and local offenses relating to the unlawful possession, sale, use, growing, and manufacturing of a narcotic drug.[1]

Forcible rape: Gaining carnal knowledge of (having sexual intercourse with) a female forcibly and against her will. Included are rape by force and attempts or assaults to rape.[1]

Incidence rate for an offense: In the criminal justice field, the number of offenses of a given type that occur in a given population during a specified time period per some population base. Incidence rates are sometimes measured in terms of arrest rates, victimization rates, or offending rates for an offense. Compare *prevalence rate for an offense*.

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[1] These are definitions used by the Federal Bureau of Investigation of the U.S. Department of Justice in the Uniform Crime Reports.

Juvenile: A young person who has not yet reached the age at which he or she should be treated as an adult for purposes of criminal law. In some States, this age is 17. In law, the terms juvenile and minor are usually used in different contexts (juvenile when referring to young legal offenders and minor when referring to legal majority or capacity).

Juvenile courts: Courts having special jurisdiction, of a paternal nature, over delinquent, dependent, and neglected children.

Juvenile justice facilities: Custodial facilities for juvenile offenders (and abused, neglected, or other minors under the jurisdiction of the juvenile or family courts). These can be classified along several, often overlapping dimensions that include purpose, term of stay, type of environment (institutional or open), and sponsorship (public or private). **Juvenile detention facilities** (usually called juvenile detention centers or juvenile halls) typically hold juveniles who have been arrested for short periods prior to adjudication; they may also be used for juveniles whose cases have been adjudicated and who are awaiting transfer to long-term placements or who have been sentenced to short periods of confinement. **Juvenile correctional facilities** are facilities for the commitment and supervision and treatment of juvenile offenders whose cases have been adjudicated. Long-term residential facilities that serve adolescent offenders range from training schools with strict controls to less-restrictive forestry camps or farms, halfway houses, and group homes. Juvenile facilities with **institutional environments** typically impose restraints on residents' movements and limit access to the community. Juvenile facilities that have **open environments** allow greater movement of residents and more access to the community. **Public juvenile facilities** are under the direct administration and operational control of a State or local government and staffed by governmental employees. **Private juvenile facilities** are either profitmaking or nonprofit and subject to governmental licensing but are under the direct administration and operational control of private enterprise: such facilities may receive substantial public funding in addition to their support from private sources.

Juvenile justice system: The system—actually 50 distinct statewide juvenile justice systems—that includes law enforcement officers and others who refer delinquent and maltreated minors to the courts, juvenile courts which apply sanctions for delinquent offenses and oversee the implementation of child protective services, juvenile detention and correctional facilities, and agencies that provide protective services and care (e.g., foster care) for minors who are victims of abuse and neglect.

Juvenile offender: A juvenile who has violated Federal, State, municipal, or local criminal laws or has committed status offenses (e.g., running away from home, truancy).

Larceny-theft (except motor vehicle theft): The unlawful taking, carrying, leading, or riding away of property from the possession or constructive possession of another. Examples are thefts of bicycles or automobile accessories, shoplifting, pocket-picking, or the stealing of any property or article which is not taken by force and violence or by fraud. Attempted larcenies are included. Embezzlement, "con" games, forgery, worthless checks, etc., are excluded.[1]

Learning disabilities: A generic term that refers to a heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning, or mathematical abilities or of social skills.

Longitudinal studies: Studies that examine the development of individuals or families or groups over a period of time. In the field of criminology, the effects of experimental interventions at different times are investigated in longitudinal-experimental studies. The aims of longitudinal-experimental studies or surveys are to establish the course of development of criminal careers, and to establish the effects of specific events on the course of development of criminal careers in order to test hypotheses about what causes criminal behavior and what can prevent it before and reduce it after it occurs.

Meta-analysis: A statistical or quantitative analysis of a large collection of results from individual studies for the purpose of integrating the findings.

Minor: A person who is under the age of legal majority, either age 18 or 19, depending on the State.

Minor offenses: See *offenses (serious and minor)*.

Motor vehicle theft: The theft or attempted theft of a motor vehicle. A motor vehicle is self-propelled and runs on the surface and not on rails. Specifically excluded from this category are motorboats, construction equipment, airplanes, and farming equipment.

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Box 13-A—Definitions That Pertain to Adolescent Delinquency—Continued

Murder and nonnegligent manslaughter: The willful (nonnegligent) killing of one human being by another. Deaths caused by negligence, attempts to kill, assaults to kill, suicides, accidental deaths, and justifiable homicides are excluded. Justifiable homicides are limited to: 1) the killing of a felon by a law enforcement officer in the line of duty and 2) the killing of a felon by a private citizen.[1]

Offending rate: The number of offenses that occur in a given population during a specified time period per some population base (e.g., 5 offenses per 100,000 population). The offending rate is usually based on offenses that are self-reported by offenders. An offending rate is a type of incidence rate.

Offenses (serious and minor): Infractions of the law irrespective of the age of the offender. For purposes of this chapter, serious offenses are Federal Bureau of Investigation Part I offenses (see below) even though individual Part I offenses may not be considered serious by other definitions. Minor offenses are Federal Bureau of Investigation Part II offenses (see below) even though individual Part II offenses may not be considered minor by other definitions.

Part I offenses (index offenses): Under the Federal Bureau of Investigation's reporting system, these are *specified violent offenses* against a person (i.e., murder and nonnegligent manslaughter, forcible rape, robbery, and aggravated assault) and *specified property offenses* (i.e., burglary, larceny-theft, motor vehicle theft, and arson).[1] For purposes of this chapter, Part I offenses are considered *serious offenses*.

Part II offenses: Under the Federal Bureau of Investigation's reporting system, any offenses not classified as Part I offenses. Part II offenses include acts that are considered crimes if committed by adults—e.g., drug abuse violations, liquor law violations, gambling, embezzlement, fraud, forgery, weapons violations, prostitution and commercial vice, offenses against the family and children, assaults without weapons, involvement with stolen property, vagrancy, disorderly conduct, driving under the influence, and drunkenness. Part II offenses also include status offenses (e.g., violation of curfew, loitering, and runaway violations).[1] For purposes of this chapter, Part II offenses are considered *minor offenses*.

Prevalence rate for an offense: In the criminal justice field, the ratio of the number of persons engaging in an offense at a particular time period to the number of persons in that population. In studies of delinquency, the prevalence rate is typically expressed as the percentage of persons in a population who engage in one or more offenses of a given type within a specified time period. If the time period is during all of adolescence or a lifetime, the prevalence rate is known as a cumulative prevalence rate. Prevalence measures the number of people involved rather than the number of offenses. Compare *incidence rate for an offense*.[1]

Prevention of adolescent delinquency: Primary prevention of adolescent delinquency means identifying individuals at risk for delinquent behavior because of their general life situations (e.g., children in stressed families) or identifying environments at risk for delinquent activity (e.g., school settings) before the delinquent behavior has occurred, and intervening to reduce the amount of delinquent behavior in that group or setting. Secondary prevention of adolescent delinquency means attempting to keep adolescents who have already shown indications of troublesome behavior (e.g., school problems) from engaging in delinquent acts such as theft or assault.

Recidivism: A tendency to relapse into a previous condition or mode of behavior (especially relapse into delinquent behavior).

Robbery: The taking or attempting to take anything of value from the care, custody, or control of a person or persons by force or threat of force or violence and/or by putting the victim in fear.[1]

Self-report data: Data regarding a survey respondent's attitudes, knowledge, or behavior that are reported by the respondent himself or herself.

Serious property offenses: For purposes of this chapter, Part I offenses against property (i.e., burglary, larceny-theft, motor vehicle theft, and arson).

Serious violent offenses: For purposes for this chapter, Part I violent offenses against a person (i.e., murder and nonnegligent manslaughter, forcible rape, robbery, and aggravated assault).

Simple assault: The unlawful intentional attempt to inflict or actual infliction of less than serious bodily injury without a deadly or dangerous weapon.[1]

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[1] These are definitions used by the Federal Bureau of Investigation of the U.S. Department of Justice in the Uniform Crime Reports.

Status offenses: Acts committed by minors that would not be considered offenses if committed by an adult (e.g., running away from home, purchasing of intoxicating liquor, truancy, curfew violations). Under the Federal Bureau of Investigation's reporting system, status offenses are considered Part II offenses.

Treatment of delinquent adolescents: A term often used synonymously with rehabilitative efforts and sometimes contrasted with punishment. **Institutionally based treatment interventions** are interventions provided in juvenile facilities with institutional environments (e.g., training schools or ranches). **Community-based treatment interventions** are interventions provided in community environments or in juvenile facilities with open environments (e.g., halfway houses, group homes).

Victimization rate: The number of offenses experienced by a given population per some population base during a given time period. For example, the victimization rate of adolescents derived from National Crime Survey data is the number of offenses experienced by individuals ages 12 years of age and over committed by individuals under age 18 per 100,000 individuals under age 18 in the population for 1 year. A victimization rate is a type of incidence rate.[2]

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[2] These are definitions used by the Bureau of Justice Statistics of the U.S. Department of Justice in the National Crime Survey.

Delinquent acts are of two general types:

1. acts committed by minors that would be considered violations of criminal law[6] if committed by an adult, and
2. status offenses—i.e., acts committed by minors that would not be considered offenses if committed by an adult (e.g., running away from home, truancy).

Adolescent delinquency can be conceptualized in various ways—e.g., in legal terms such as arrest and adjudication or in behavioral terms such as stealing, assault, murder. The use of different definitions of delinquency confounds analyses of all areas of delinquent behavior—the incidence and prevalence of delinquency, factors associated with delinquency, and, perhaps most critically, assessments of the effectiveness of delinquency prevention and treatment efforts. The definition chosen determines what type of adolescents are studied; for example, if the legal definition is used, only adolescents who are officially recorded as delinquents are included in determining the number of offenses committed by adolescents. The definition of delinquency chosen is also critical in measuring the "success" of prevention and treatment programs because it determines the measure of preintervention and postintervention delinquency to be used.

Sources and Limitations of Data on Adolescent Delinquency

Estimating the extent of adolescent involvement in delinquency is difficult. Information about the four principal sources of national data on the incidence, prevalence, and demographic correlates of adolescent delinquency is shown in table 13-1:

1. the Uniform Crime Reports,
2. the National Crime Survey,
3. the National Youth Survey, and
4. the Monitoring the Future/High School Seniors Survey.

Each source has substantial limitations, and the different sources have different sample populations, have different methods, and cover different ages, offenses, and years.[7] Most researchers and policymakers agree that *no single source provides an adequate measure of delinquency among adolescents* (58,99,100,101,123, 201,202,214,353).[8]

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[6] Following the terminology of the field, the terms "crime" and "criminal" are *not* used to refer to acts committed by minors that would be considered crimes if committed by adults. Instead, the terms "offense" and "delinquent acts" are used when referring to such acts. The terms "crime" and "criminal" are only used to refer to such acts committed by adults. (Offense, however, is a generic term that may be used to describe both delinquent acts and crimes.)

[7] Extensive descriptions and comparative analyses of these sources are in the literature. See, for example, J.H. Laub, "Assessment of National Juvenile Justice Data Collection Efforts: Children/Youth as Victims of Personal Crimes and Other Offenses by Peers/Others" (257); S. Menard, "Short-Term Trends in Crime and Delinquency: A Comparison of UCR, NCS, and Self-Report Data" (282); J.G. Bachman and L.D. Johnston, *The Monitoring the Future Project: Design and Procedures* (22); J.G. Bachman, L.D. Johnston, and P.M. O'Malley, *Monitoring the Future; Questionnaire Responses From the Nation's High School Seniors, 1976* (23).

[8] Nonetheless, the advantages and limitations of official records and self-reports are somewhat complementary. If both types of sources show similar results, the results have greater validity.

Table 13-1—Comparison of Sources of National Data on Adolescent Delinquency

	Uniform Crime Reports (U.S. Department of Justice)	National Crime Survey (U.S. Department of Justice)	National Youth Survey (Elliott et al.)	Monitoring the Future/ High School Seniors Survey (Bachman et al.)
Period measured	Annually since 1930	Annually since 1973	Annually from 1976-1980, and in 1983, 1986, 1989	Annually since 1975
Data source	Arrests reported by law enforcement agencies	Self-reports by victims	Self-reports by survey respondents	Self-reports by survey respondents
Data collection method	Arrests are reported to the FBI (or to centralized State agencies that then report to the FBI) by over 12,000 law enforcement districts	National household interview survey of a national sample of 49,000 households with 101,000 persons	National interview survey of a sample of 1,044 households with a cohort of 1,725 youth ages 11 to 17 in 1976	National survey of a sample of about 16,000 to 18,000 high school seniors, with an annual followup survey of sample subset
Serious offenses included	Murder and nonnegligent manslaughter Forcible rape Robbery Assault (aggravated) Burglary Larceny-theft Motor vehicle theft Arson	Rape Robbery (personal) Assault (aggravated) Household burglary Motor vehicle theft Household larceny Personal larceny	Rape[a] Robbery Assault (aggravated) Burglary Larceny/theft Motor vehicle theft Arson (as of 1980)	Robbery[b] Assault (aggravated) Larceny-theft Motor vehicle theft Arson
Minor offenses included	Other (nonaggravated assaults) Forgery and counterfeiting Fraud Embezzlement Stolen property offenses Vandalism Weapons offenses Prostitution and commercialized vice Sex offenses (except forcible rape and prostitution and commercialized vice) Drug abuse violations Gambling Offenses against family and children Liquor law violations Driving under the influence Drunkenness Disorderly conduct Vagrancy All other nontraffic offenses Suspicion Curfew and loitering offenses (limited to persons under age 18) Runaways (limited to persons under age 18)	Simple assault	Simple assault Stolen property: buying, receiving, possessing Vandalism (except 1977) Weapons: carrying, possessing, etc. Prostitution and commercialized vice (been paid for sex) Drug abuse violations (includes marijuana) Liquor law violations (alcohol use for those under age—varies by year and jurisdiction; sale of alcohol to a minor) Drunkenness Disorderly conduct Sex offenses other than prostitution and rape (obscene phone calls; sexual intercourse for those under age) Fraud (1979, 1980, 1983, 1986, 1989) Forgery and counterfeiting (passing bad checks or phony money) (1979, 1980, 1983, 1986, 1989) Embezzlement (1983, 1986, 1989) Driving under the influence (1983, 1986, 1989) Runaways (1976, 1980)	Simple assault Vandalism Liquor law violation (alcohol use; whether this is underage may vary by jurisdiction and by year Drug abuse violations (includes marijuana)

Table 13-1—Comparison of Sources of National Data on Delinquency—Continued

	Uniform Crime Reports (U.S. Department of Justice)	National Crime Survey (U.S. Department of Justice)	National Youth Survey (Elliott et al.)	Monitoring the Future/ High School Seniors Survey (Bachman et al.)
Adolescent ages[c] of offenders measured	10-12, 13-14, 15, 16, 17, 18	Under 12, 12-14, 15-17, 18-20	11-17 (1976) 12-18 (1977) 13-19 (1978) 14-20 (1979) 15-21 (1980) 18-24 (1983)	High school seniors (17 and 18)
Ages of offenders, reported	Under 10-65+	Under 12-30+	11-30	17-28

[a] The specific terms in the National Youth Survey are not exactly as listed here, but the survey items were designed to allow for comparison with the Uniform Crime Reports.

[b] The specific terms in the Monitoring the Future/High School Seniors Survey are not exactly as listed here, but most of them approximate those in the Uniform Crime Reports. It should be noted, however, that motor vehicle theft in the Monitoring the Future database corresponds only weakly with motor vehicle theft in the Uniform Crime Reports. In the Monitoring the Future survey, the term motor vehicle theft means taking a motor vehicle without permission, and there is no implication that the vehicle has been stolen.

[c] Adolescents, for the purpose of this OTA report, are individuals age 10 through 18.

SOURCES: **Uniform Crime Reports:** U.S. Department of Justice, Federal Bureau of Investigation, *Uniform Crime Reports: Crime in the United States* (Washington, DC: U.S. Government Printing Office, various dates). **National Crime Survey:** U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics, *Criminal Victimization in the United States, 1987,* A National Crime Survey Report, NCJ-115524 (Washington, DC: June 1989). **National Youth Survey:** D.S. Elliott, S.S. Ageton, D. Huizinga, et al., *The Prevalence and Incidence of Delinquent Behavior: 1976-1980,* National Youth Survey Report No. 26 (Boulder, CO: Behavioral Research Institute, March 1983); S. Menard, Research Associate, Behavioral Research Institute, Boulder, CO, personal communication, November 1990. **Monitoring the Future/High School Seniors Survey:** J.G. Bachman, L.D. Johnston, and P.M. O'Malley, *Monitoring the Future: Questionnaire Responses From the Nation's High School Seniors* (Ann Arbor, MI: Institute for Social Research, University of Michigan, various dates); N. Zill, J.L. Peterson, K.A. Moore, et al., *National Statistics on Children, Youth, and Their Families: A Guide to Federal Data Programs,* 2nd ed. (Washington, DC: April 1988).

The *Uniform Crime Reports* program maintains arrest data reported annually by local law enforcement agencies to the Federal Bureau of Investigation in the U.S. Department of Justice (407,408,409,410). Uniform Crime Reports data have been collected since 1930 and cover more types of offenses than data from other sources; they also cover offenses committed by individuals of all ages, and they are up-to-date and easy to interpret. One limitation of Uniform Crime Reports data, however, is that they may be affected by underreporting of arrests, particularly underreporting of arrests for minor offenses (282). Another limitation is that they may be affected by law enforcement agencies' bias toward the detection and arrest of offenders from certain groups in society (e.g., black male adolescents) (280). Furthermore, the use of arrest rate data to detect trends over time is problematic. One reason is that law enforcement agencies may focus on different types of offenses in different historical periods (e.g., a drug crisis may limit resources available for the detection of other types of crimes); another reason is that changes may occur in the definitions of offenses.

The *National Crime Survey* is a national household interview survey of Americans ages 12 and over administered annually by the Bureau of Justice Statistics of the U.S. Department of Justice (416,419,423,447). The National Crime Survey obtains information based on victims' reports about offenses that may not have been reported to or detected by law enforcement officials and thus may not be reflected in the Uniform Crime Reports. The National Crime Survey has several important limitations with respect to adolescents. First, the designation of the ages of the victimizers relies on accurate recall by the victim. Second, the survey has been less successful in interviewing young black males than in interviewing other groups. Third, victims often do not identify victimizers whom they know (257). Other limitations of the National Crime Survey are that it does not collect data from people who do not live in households, that it does not obtain data from victims younger than age 12, that the data reports are not timely, and that only six out of eight Federal Bureau of Investigation Part I offenses (serious offenses) and only one Federal Bureau of Investigation Part II offense (minor offense) are covered. The usefulness of the National Crime Survey for trend analysis is limited because the methods of the study have changed over time (257).

The *National Youth Survey* is a confidential interview survey begun by Elliott and colleagues at the Behavioral Research Institute in Boulder, Colorado (100,102,103,104). The survey began in 1976 with a national cohort of 1,725 11- to 17-year-olds (100). Since 1976, the survey has continued to follow the original cohort's involvement in delinquency and crime, substance use, and mental health problems.[9] The 1976 and 1977 portions of the National Youth Survey, conducted when cohort members were ages 11 to 17 and ages 12 to 18, respectively, are useful in revealing the incidence and prevalence of offenses committed by adolescents, including those not known to law enforcement agencies or victims. It is important to note, however, that these data for adolescents are now about 15 years old and may not reflect current adolescents' involvement in offenses. Another limitation of the National Youth Survey is that although it includes a broad spectrum of serious and minor offenses, it does not include all Part I offenses (serious offenses). Another point is that survey respondents may underreport their involvement in delinquency (257); on the other hand, Elliott and his colleagues have had to adjust reported rates for serious offenses downward when discussion with the respondents revealed that the actions reported were not ones that would have subjected the respondents to arrest (98).

The *Monitoring the Future/High School Seniors Survey* is a national survey conducted annually since 1975 by Bachman and other researchers at the University of Michigan's Institute for Social Research (22,23,24,25). This survey, which uses a self-report instrument, annually surveys 16,000 to 18,000 high school seniors (and conducts an annual followup survey of a sample subset) (25). Although it includes some items pertaining to involvement in delinquency (and for the older respondents, crimes), the Monitoring the Future/High School Seniors Survey is limited in that it begins with those who are already high school seniors, excludes school dropouts, and does not collect data that are completely racially and ethnically representative of the country's adolescents (257).

The nationally oriented Uniform Crime Reports, National Crime Survey, National Youth Survey, and Monitoring the Future/High School Seniors Survey are complemented by *community-level, special research studies* that examine the "causes" of delinquency. Most of these community-level studies are cross-sectional rather than longitudinal, however, and many have design problems that prevent them from assigning causality (126). Some study designs, for example, use measures of delinquency (e.g., arrests) for a period in the past while deriving "causal" variables from reports in the present. This temporal sequence is more likely to measure the effects of delinquency on the variables than the reverse (240). Prospective longitudinal studies offer the best opportunity for identifying "causal" factors, but they are expensive and rare. Further, even some longitudinal studies are based on retrospective self-reports that contain biases due to respondents' poor memories; others may be applicable only to specific geographic areas or social climates.

Incidence and Prevalence of Adolescent Delinquency

In considering adolescent delinquency, it is important to note that the terms incidence rates and prevalence rates mean something different in the criminal justice field than they do in public health epidemiology (see box 13-A).[10] Incidence rates—the number of offenses or arrests per 100,000 adolescents in the population in any given year—will not reveal how many adolescents are involved in delinquency, because incidence rates measure the number of offenses and one adolescent could commit any number of offenses in a given year. Conversely, prevalence rates—the percentage of adolescents committing delinquent acts in a given year—will provide information on how many adolescents are committing delinquent acts in a given time period but will not reveal how many delinquent acts are committed.

How Many Delinquent Acts Are Committed by Adolescents?

Information on incidence rates for offenses committed by adolescents can give a partial understanding of the extent of adolescent involvement in delinquent behavior. Arrest, victimization, and self-reported offending rates are analogous to incidence rates, and this section reviews data on arrest,

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[9] Results of analyses by Elliott and his colleagues of covariation among these problems are reported in "Covariation of Adolescent Health Problems," a paper prepared for OTA by D. Wayne Osgood and Janet K. Wilson (304).

[10] A confounding factor in determining the incidence and prevalence of delinquency is that most delinquent acts are committed by groups (e.g., gangs) rather than individuals (121,468). Determining the incidence and prevalence of offending by adolescents in groups such as gangs is extremely difficult because the composition of adolescent gangs changes very often (123).

Table 13-2—Comparison of Rates of Serious Offenses Reported by Different Sources of National Data on Adolescent Delinquency

	Uniform Crime Reports: Arrest rate 1988—under age 18[a]	National Crime Survey: Victimization rate 1987—age 17 and under[b]	National Youth Survey: Adjusted self-reported offending rate 1979—ages 14-20[c] [d]
Serious violent offenses	143	573	34,570
Serious property offenses	1,067	NA	137,135

NA = not available.

[a] *Arrest rates* are the number of arrests made in a given population per some population base during a given time period. The arrest rate here is the number of arrests for serious offenses (violent or property) of individuals under age 18 in 1988 per 100,000 individuals under age 18 in the population in 1988. Serious violent offenses included were murder and nonnegligent manslaughter, forcible rape, robbery, and aggravated assault. Serious property offenses included were burglary, larceny-theft, motor vehicle theft, and arson.

[b] *Victimization rates* are the number of offenses experienced by a given population per some population base during a given time period. The victimization rate here is the number of serious offenses (violent or property) experienced by individuals 12 years of age and over committed by individuals under age 18 in 1987 per 100,000 individuals under age 18 in the population in 1987. Serious violent offenses included were rape, robbery, and aggravated assault.

[c] *Offending rates* are the number of offenses that occur in a given population per some population base during a given time period. The *offending rate* here is the number of serious offenses (violent or property) self-reported by individuals 14 to 20 years of age per 100,000 individuals 14 to 20 years of age in 1979. Serious violent offenses included were rape, robbery, and assault. Serious property offenses included were larceny-theft, motor vehicle theft, and burglary.

[d] Adjusted rates are rates corrected for trivial events that would not have evoked a police response.

SOURCES: **Uniform Crime Reports**: U.S. Department of Justice, Federal Bureau of Investigation, *Uniform Crime Reports: Crime in the United States, 1988* (Washington, DC: U.S. Government Printing Office, 1989). **National Crime Survey**: U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics, calculations based on unpublished National Crime Survey data on criminal victimization, Washington, DC, 1990. **National Youth Survey, adjusted rates**: D.S. Elliott and D. Huizanga, "Self-Reported Measures of Delinquency and Crime: Micro Issues and Computer Findings," Behavioral Research Institute, Boulder, CO, 1984.

victimization, and self-reported offending rates related to offenses committed by adolescents. Most of the discussion focuses on serious offenses rather than minor offenses.

In 1988, there were 1.6 million *arrests* of U.S. adolescents ages 10 to 17 (410,412). Uniform Crime Reports data for 1988 indicate that arrests for serious property offenses by adolescents are much more common than arrests for serious violent offenses against persons (see table 13-2). Self-reported offending rate data from the National Youth Survey (when adjusted to exclude trivial events) are consistent with arrest data in showing that serious property offenses are committed relatively more frequently by adolescents than are serious violent offenses (see table 13-2).[11] It is important to note, however, that the self-report data from the National Youth Survey are dated and may not apply to today.

Although current rates of arrests for serious offenses by U.S. adolescents may seem high, *there is some evidence that the aggregate arrest rates for serious violent offenses and for serious property offenses committed by U.S. adolescents have declined since the mid-1970s.* The aggregate arrest rates among individuals under age 18 for serious violent offenses (murder, forcible rape, robbery, and aggravated assault) declined slightly (1.3 percent) from 1974 to 1983[12] then leveled off at the 1973 level (see figure 13-1). The arrest rates among individuals under age 18 for serious property offenses (burglary, larceny-theft, motor vehicle theft, and arson) declined sharply from 1975 to 1983 and have hovered around the 1983 level ever since (see figure 13-2).

The recent decline in aggregate arrest rates for serious offenses among individuals under age 18 is paralleled by a decline in the aggregate victimization rate for rape, robbery, and assault committed by persons under age 18 (see figure 13-3). Also, the victimization rate for serious offenses committed by 12- to 17-year-olds decreased 8 percent from 1973 to 1983 (256) and after that fluctuated around the 1982 level.

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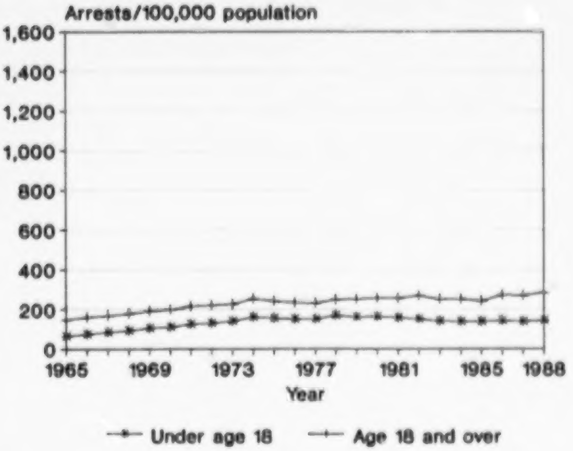
[11] As noted above, victims are, reasonably, not asked to report on property offenses. As a consequence, the relative rates of violent and property offenses cannot be compared using victimization data. Victimization rates for violent offenses are higher than arrest rates, but much lower than self-reported offending rates, for such offenses.

[12] Different data sources may use different age categories, making interpretation of trends more difficult. For example, some data are available for adolescents ages 10 to 18, while other statistics are aggregated below age 18 and the 10- to 18-year-old offenders cannot be distinguished from those younger than 10 years of age. However, the proportion of arrests for serious violent and property offenses committed by children under age 10 is extremely small (see figures 13-4 and 13-5). The relative insignificance of arrest data for children under age 10 may reflect a law enforcement bias against such arrests as well as the rarity of such offenses by young children.

Figure 13-1—Arrest Rates[a] for Serious Violent Offenses[b] by Persons Under Age 18 and Age 18 and Over, 1965-88

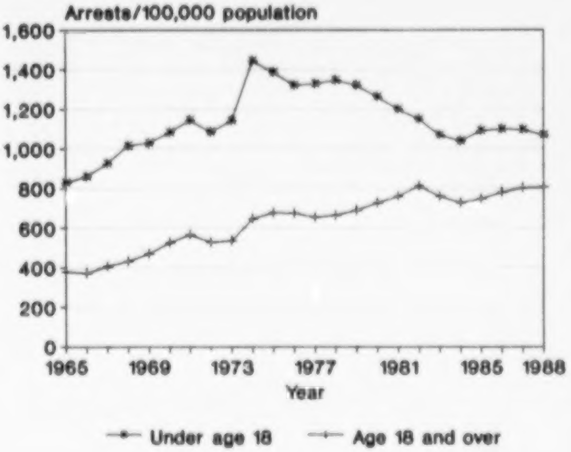


[a] The *arrest rate* is the number of arrests made in a given population per given population base. The arrest rate here is the number of arrests per 100,000 population of the same age group.

[b] *Serious violent offenses* are murder and nonnegligent manslaughter, forcible rape, robbery, and aggravated assault.

SOURCE: U.S. Department of Justice, Federal Bureau of Investigation, *Age-Specific Arrest Rates and Race-Specific Arrest Rates for Selected Offenses 1965-1988* (Washington, DC: April 1990).

Figure 13-2—Arrest Rates[a] for Serious Property Offenses[b] by Persons Under Age 18 and Age 18 and Over, 1965-88



[a] The *arrest rate* is the number of arrests made in a given population per given population base. The arrest rate here is the number of arrests per 100,000 population of the same age group.

[b] *Serious property offenses* are burglary, larceny-theft, motor vehicle theft, and arson.

SOURCE: U.S. Department of Justice, Federal Bureau of Investigation, *Age-Specific Arrest Rates and Race-Specific Arrest Rates for Selected Offenses 1965-1988* (Washington, DC: April 1990).

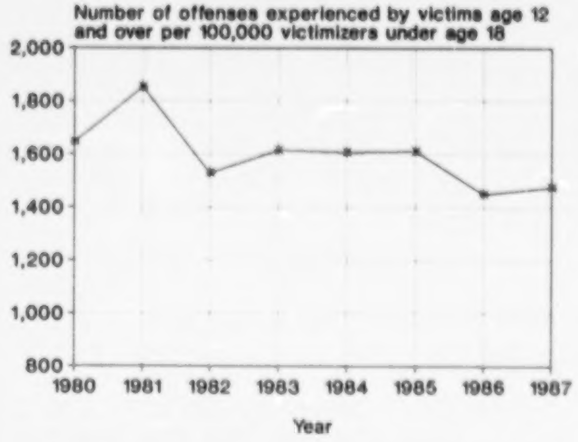
Trends in arrest rates among U.S. adolescents vary tremendously by type of offense, and considering aggregate figures alone, without looking at trends for specific offenses, may lead one to miss important policy implications (409). *Potentially the most troubling recent trends are increases in arrest rates among U.S. adolescents ages 13 through 18 for the serious violent offenses of murder and nonnegligent manslaughter* (see figure 13-4) and for *aggravated assault* (see figure 13-5). There also have been increases in arrest rates among U.S. adolescents for the less serious offenses of simple assault and weapon use (409). Fortunately, arrest rates among U.S. adolescents for some serious property offenses (robbery, burglary) and minor offenses (narcotic drug law/drug abuse violations) have recently declined. Arrests for larceny-theft have been relatively stable since 1974.

The interpretation of arrest rates is actually somewhat difficult. The reason is that changes in arrest rates over time may be biased by greater or lesser law enforcement efforts directed toward particular offenses over time, shifts in police capacity to apprehend offenders, or other factors unrelated to changes in adolescent behavior. It is interesting to note that self-reported offending rate data from high school seniors support somewhat the inference that there has been an increasing adolescent commission

Photo credit: Benjamin Smith, Washington, DC

Recent increases in arrest rates among U.S. adolescents for the serious violent offenses of murder/nonnegligent manslaughter and aggravated assault are disturbing.

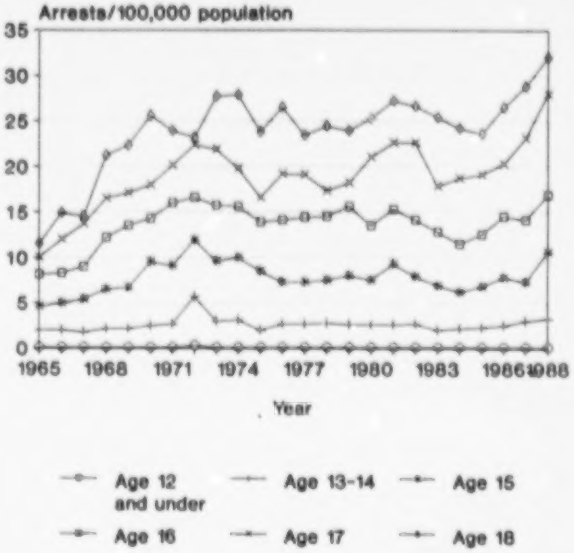
Figure 13-3—Victimization Rates for Rape, Robbery, and Assault[b] Committed by Persons Under Age 18, 1980-87



[a]The *victimization rate* is the number of offenses experienced by a given population per some population base during a given time period. The victimization rate here is the number of rapes, robberies, and assaults experienced by victims age 12 and over committed by victimizers under age 18 per 100,000 victimizers under age 18.
[b]Assault includes aggravated assault and simple assault.

SOURCE: K. Whitaker, Office of Justice Programs, Bureau of Justice Statistics, U.S. Department of Justice, compilation of National Crime Survey data from *Criminal Victimization in the United States 1980-87*, Washington DC, 1989.

Figure 13-4—Arrest Rates[a] for Murder and Nonnegligent Manslaughter by Persons Age 18 and Under, 1965-88



[a]The *arrest rate* is the number of arrests made in a given population per given population base. The arrest rate here is the number of arrests per 100,000 population of the same age group.

SOURCE: U.S. Department of Justice, Federal Bureau of Investigation, *Age-Specific Arrest Rates and Race-Specific Arrest Rates for Selected Offenses 1965-1988* (Washington, DC: April 1990).

of some violent offenses; however, reports of crime victims do not support that inference (see table 13-3).[13]

To the extent that arrest rates and adolescents' self-reported offending rates reflect adolescent behavior, the increase in rates for simple assault, aggravated assault, and murder and nonnegligent manslaughter[a] *could be indicative of a trend among adolescents to increased violent assaults against persons*. This increase in violent assaults points to an increasing need for prevention.[14]

How Many Adolescents Commit Delinquent Acts?

For the purposes of understanding adolescent involvement in delinquent behavior and formulating policy to prevent and control delinquency, it may be important to know not just the number of offenses but the number of adolescents who commit delinquent acts, the frequency with which such acts are committed, and the types and seriousness of the offenses. If most delinquent offenses are committed by a small number of adolescents who commit many offenses each, the implications are likely to be different from the implications that would exist if individual adolescent offenders commit only a few offenses each.

Determining how many adolescents commit delinquent acts nationwide is as difficult as determining how many offenses are committed by adolescents. Recent data on the number of U.S. adolescents

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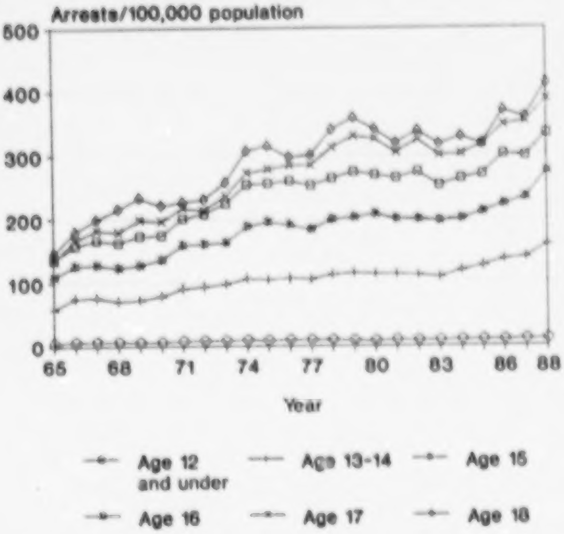
[13] Although they were not asked about other violent offenses (e.g., murder), high school seniors were increasingly likely to report having committed an aggravated assault in the period from 1975 to 1985 (303). On the other hand, victims reported no increase in being assaulted by 15- to 17-year-olds in the period from 1980 to 1987 (see table 13-3).

[14] As discussed below, even if arrest rates for certain violent offenses were not increasing, very little effort has been devoted to attempts to prevent adolescents' use of violence. One could argue, therefore, that the need for preventive interventions exists regardless of changes in rates.

Figure 13-5—Arrest Rates[a] for Aggravated Assault by Persons Age 18 and Under, 1965-88



[a] The *arrest rate* is the number of arrests made in a given population per given population per some base. The arrest rate here is the number of arrests per 100,000 population of the same age group.

SOURCE: U.S. Department of Justice, Federal Bureau of Investigation, *Age-Specific Arrest Rates and Race-Specific Arrest Rates for Selected Offenses 1965-1988* (Washington, DC: April 1990).

engaging in delinquent acts are not available. Data on adolescents in the National Youth Survey are quite old, having been collected between 1976 and 1980. Data in the Uniform Crime Reports and the National Crime Survey provide information on the number of offenses and cannot be easily manipulated to obtain prevalence rates. Information about prevalence can be obtained from longitudinal research projects, but such studies are typically community based and may not be generalizable to other communities.

Available data from the National Youth Survey suggest that a large majority of U.S. adolescents commit minor offenses at least once and that a considerable minority of adolescents also commit serious offenses at least once. A small percentage repeatedly engage in both serious and nonserious acts of delinquency (100). Elliott and his colleagues conducting the National Youth Survey discovered that most adolescents become involved in some level of delinquent behavior during the course of their adolescence—although their infractions are usually relatively minor (e.g., a status offense, vandalism, minor assaults) (100). In addition, they found that 21 percent of the participants in the survey had committed at least one *serious* offense in 1976 (100). If 21 percent of the 29.2 million adolescents who were 11 to 17 years old in 1976 committed serious offenses, then approximately 6.1 million adolescents committed one or more serious offenses that year.

The findings of many other studies parallel those of the National Youth Survey. A review published in 1981 noted that a "substantial minority of the adolescent male population has been or will be arrested or convicted" (128). The figures vary from 20 to 70 percent depending on demographic characteristics, seriousness of offense, or other factors included in the studies reviewed (128). Another review, published in 1986, noted that the best available estimates indicate that between 25 to 35 percent of urban males will be arrested for a serious crime in their lifetimes, and 15 percent will be arrested by age 18 (48).

What Is the Pattern of Committing Serious Delinquent Acts Among Adolescents?

An understanding of the duration and level of involvement of adolescents in serious delinquent behavior is important to an analysis of policy implications. Available data suggest that not all adolescents who commit a single serious offense are destined to become "career criminals." For which adolescents does involvement in serious delinquent behavior suggest the beginning of a criminal career and for which is such involvement limited?[15]

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[15] An important consideration in tracking the careers of criminals is the possible effects of involvement with the juvenile justice system. A basic question is whether being apprehended leads to worse or better behavior. Does being arrested early in life lead to exposure to older adolescents and new forms of delinquent behavior or expectations by police and others that the adolescent *is* "a delinquent"? Or do the adolescents who begin their careers of multiple offenses early and continue unabated do so because they have escaped apprehension? As discussed more fully below under effectiveness of the juvenile justice system, available data are unable to answer this question definitively.

Table 13-3—Serious Offenses by 17-Year-Olds: Trends in the Incidence Rates Reported by Different Sources of National Data on Adolescent Delinquency[a]

		Data source			
Type of offense	Years[b]	Uniform Crime Reports (arrest rates[c])	National Crime Survey (victimization rates[d])	National Youth Survey (self-reported offending rates[e])	Monitoring the Future/High School Seniors Survey (self-reported offending rates[e])
Aggravated assault	1976-80	Upward trend		No obvious trend	
	1975-85	Upward trend			Upward trend
	1980-87	Upward trend	No obvious trend		
	1978-88	Upward trend			
	1984-88	Upward trend			
Robbery	1976-80	Upward trend		No obvious trend	
	1975-85	No obvious trend			No obvious trend
	1980-87	Downward trend	No obvious trend		
	1978-88	Downward trend			
	1984-88	Downward trend			
Forcible rape	1976-80	Upward trend		No obvious trend	
	1980-87	No obvious trend	No obvious trend		
	1978-88	No obvious trend			
	1984-88	Downward trend			
Murder and nonnegligent manslaughter	1978-88	No obvious trend			
	1984-88	Upward trend			
Larceny-theft	1976-80	No obvious trend		No obvious trend	
	1975-85	No obvious trend			Downward trend
	1978-88	No obvious trend			
	1984-88	No obvious trend			
Burglary	1976-80	No obvious trend		No obvious trend	
	1978-88	Downward trend			
	1984-88	Downward trend			
Motor vehicle theft	1976-80	No obvious trend		No obvious trend	
	1975-85	No obvious trend, then downward trend, then upward trend			No obvious trend
	1978-88	No obvious trend, then downward trend, then upward trend			
	1984-88	Upward trend			
Arson	1975-85	Upward trend, then downward trend, then no obvious trend			No obvious trend
	1978-88	No obvious trend, then downward trend, then no obvious trend			
	1984-88	No obvious trend			

[a] Since 17 was the only age included in all four national data sources, the trends described for individual offenses are for 17-year-olds.

[b] The arrest rate here refers to the number of arrests of 17-year-olds per 100,000 17-year-olds in the population. The years used as the beginning and the end points for trends in the table reflect readily available data.

[c] This column shows trends in arrest rates for serious offenses (violent or property) among 17-year-olds in 1988.

[d] The victimization rate here is the number of serious offenses (violent or property) experienced by individuals 12 years of age and over committed by individuals 17 years of age in 1987 per 100,000 individuals 17 years of age in the population.

[e] The self-reporting offending rate here is the number of serious offenses (violent or property) self-reported by individuals 17 years of age per 100,000 individuals 17 years of age in the population.

SOURCES: **Uniform Crime Reports**: U.S. Department of Justice, Federal Bureau of Investigation, *Uniform Crime Reports, Crime in the United States, 1988* (Washington DC: U.S. Government Printing Office, August 1989). **National Crime Survey**: U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics, *Criminal Victimization in the United States, 1987*, A National Crime Survey Report, NCJ-115524 (Washington, DC: June 1989). **National Youth Survey**: D.S. Elliott, S.S. Ageton, D. Huizinga, et al., *The Prevalence and Incidence of Delinquent Behavior: 1976-1980*, National Youth Survey Report No. 26 (Boulder, CO: Behavioral Research Institute, March 1983). **Monitoring the Future/High School Seniors Survey**: D.W. Osgood, P.M. O'Malley, J.G. Bachman, et al., "Time Trends and Age Trends in Arrests and Self-Reported Behavior," *Criminology* 27(3):389-417, 1989; J.G. Bachman, L.D. Johnston, and P.M. O'Malley, *Monitoring the Future: Questionnaire Responses From the Nation's High School Seniors, 1986* (Ann Arbor, MI: Institute for Social Research, University of Michigan, 1987).

Elliott and his colleagues conducting the National Youth Survey found that, over a 5-year period (1976 to 1980), the *majority of adolescents who committed any serious violent offense had a "career length" of 1 year* (108). Their finding is consistent with studies of arrest histories that found that a majority of adolescent violent offenders have a single arrest for a serious violent offense and few continue violent offending into adulthood (180).

But the National Youth Survey and other studies have found that *there is a small subset of adolescent offenders who commit multiple, serious offenses* (48,108,119,129,180,369,458,459). The estimates vary from study to study, in part because the studies use different data sources and were done at different times. Adolescent offenders who commit multiple, serious offenses have received considerable attention in the research literature because they are the adolescents most likely to go on to commit multiple crimes as adults and are responsible for most of all arrests (48,180). Chronic offenders also appear to be different from nonchronic offenders because they are likely to have begun delinquent behaviors at an earlier age and to have continued them later (48,119,129,366,458).

Researchers differ as to whether adolescents who commit multiple offenses move toward increasingly serious offenses over time. Some researchers interpret the evidence to indicate that delinquent careers escalate from the nonviolent to the violent (48,458); other researchers conclude that there is no consistent sequence in the appearance of violence in the course of an adolescent's offending (180,182).

It is likely that adolescents who commit more than one offense commit a variety of offenses, both serious and minor, rather than specializing in a single type of offense (108,126,129,180,182). According to one study, chronic offenders typically alternate between property offenses and a smaller number of violent offenses (182). The National Youth Survey found that even adolescents involved in serious violent offenses commit other types of crimes (108). Indeed, it found that adolescents involved in serious offenses usually commit relatively few serious offenses and many minor offenses and are therefore more likely to be arrested for a less serious offense (101). The relatively small number of adolescent males who commit sex crimes do not commit other types of crimes (329).

Factors Associated With Adolescent Delinquency

The importance of understanding factors that are correlated with or predict delinquent behavior (risk factors) lies in the possible use of such understanding as the basis for targeting resources and for developing and evaluating interventions. It is important to note that conclusive information about many of the factors that have been investigated as possible correlates of adolescent delinquency is not available. Many adolescents (an average of 40 percent across studies) who have been exposed to risk factors do not become offenders, as measured by arrest before age 18 (432). Furthermore, a small number of adolescents become delinquent without any identifiable risk factors in their background (353).[16] This group remains an "enigma," testifying to lack of adequate understanding of delinquency (353).

Demographic Factors Associated With Delinquency

National data on U.S. adolescents' involvement in delinquency are often reported in terms of demographic factors—age, gender, race, ethnicity, and urban/rural location. Current national data sources on delinquency do not report information on socioeconomic status. Communitywide analyses are the source of much data on this factor.

Age—Involvement in delinquency changes with age during adolescence. Incidence rates, as measured by arrest rates, victimization rates, and offending rates, indicate that, in general, the level of adolescent involvement in delinquent acts—whether violent or nonviolent, serious or minor—generally *peaks some time between 15 and 17 years of age* and declines thereafter (102,107,122,284,285, 412).[17]

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[16] Information about factors that protect adolescents exposed to risk factors for delinquency is presented later in this chapter. See box 13-B.

[17] Aggregate arrest rates for serious violent offenses and arrest rates for aggravated assault follow a slightly different pattern. Aggregate *arrest rates* for serious violent offenses typically peak at 18 years of age and the *arrest rate* for aggravated assault usually peaks at age 21 (412). The peak age for aggravated assault in arrest rate data is much higher than the peak ages of 14 to 16 reported for felony assault in the National Youth Survey (100) and the peak age of 17 reported in the Monitoring the Future/High School Seniors Survey for aggravated assault (303). Perhaps arrest data show a higher peak age than adolescents' self-reports because older adolescents and young adults are more likely than younger adolescents to be in locations where police are readily available (e.g., bars). Assaults by younger adolescents may take place in schools and playgrounds where they have been less likely to be reported to or observed by police. Arrest rates for arson are unusual in that they have peaked at 13 to 15 years of age for more than 21 years (412).

Table 13-4—Rates of Involvement in Serious Offenses: Male-to-Female Ratios Reported by Different Sources of National Data on Adolescent Delinquency

	Male-to-female ratios			
	Uniform Crime Reports: Arrest rate, 1987—under age 18[a]	National Crime Survey: Victimization rate, 1987—under age 18[b]	National Youth Survey: Self-reported offending rate, 1976—ages 11-17[c]	National Youth Survey: Prevalence rate, 1976—ages 11-17[d]
Serious offenses	7.5:1		0.5:1 (excluding murder and arson)[e]	3:1 (excluding murder and arson)
Serious violent offenses	7.5:1	307:1[f]	0.5:1 (excluding murder)[e]	3:1
Murder	10.8:1	NA	NA	NA
Forcible rape	44.3:1	16.6:1	NA	NA
Aggravated assault	5.2:1	5.3:1	NA	NA
Robbery	12.9:1	12.1:1	0.5:1[e]	3:1
Felony assault[g]			0.5:1[e]	3:1
Serious property offenses	3.6:1		NA	NA
Burglary	11.9:1		NA	NA
Larceny/theft	2.5:1		NA	NA
Motor vehicle theft	8.0:1		NA	NA
Arson	8.5:1		NA	NA
Felony theft[h]			2:1	2:1

NA = not available.

[a] *Arrest rates* are the number of arrests made in a given population per some population base in a given time period. The male-to-female ratios for arrest rates here were calculated from arrest rates in the U.S. Department of Justice, Federal Bureau of Investigation, *Age-Specific Arrest Rates and Race-Specific Arrest Rates for Selected Offenses, 1965-1988* (412).

[b] *Victimization rates* are the number of offenses experienced by a given population committed by individuals per some population base over a specified time period. The male-to-female ratios for victimization rates here were derived from unpublished data from the U.S. Department of Justice, Bureau of Justice Statistics, National Crime Survey (421).

[c] *Offending rates* are the number of self-reported offenses that occur in a given population per some population base during a specified time period. The male-to-female ratios for offending rates here are from D.S. Elliott, S.S. Ageton, D. Huizinga, et al., *The Prevalence and Incidence of Delinquent Behavior, 1976-1980* (100).

[d] *Prevalence rates* here are the proportion of individuals in the same population involved in a self-reported offense within a designated time period. The male-to-female ratios for prevalence rates here are from D.S. Elliott, S.S. Ageton, D. Huizinga, et al., *The Prevalence and Incidence of Delinquent Behavior, 1976-1980* (100).

[e] Male-to-female ratios for serious offenses, serious violent offenses, and specific violent offenses ranged from 2:1 to 26:1, but the majority were 5:1 or greater (100).

[f] Serious violent offenses included in the National Crime Survey were rape, robbery, aggravated assault, and simple assault.

[g] Felony assault includes aggravated assault, sexual assault, and gang fights.

[h] Felony theft includes larceny-theft, motor vehicle theft, burglary, and possession of stolen goods.

SOURCES: **Uniform Crime Reports:** U.S. Department of Justice, Federal Bureau of Investigation, *Uniform Crime Reports: Crime in the United States, 1987* (Washington, DC: U.S. Government Printing Office, 1988). **National Crime Survey:** U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics, *Criminal Victimization in the United States, 1987*, A National Crime Survey Report, NCJ-115524 (Washington, DC: August 1988). **National Youth Survey:** D.S Elliott, S.S. Ageton, D. Huizinga, et al., *The Prevalence and Incidence of Delinquent Behavior: 1976-1980*, National Youth Survey Report No. 26 (Boulder, CO: Behavioral Research Institute, March 1983).

These incidence data are supported by prevalence data from the National Youth Survey. Elliott and colleagues found that approximately 5 percent of respondents at each age between ages 12 and 17 had committed three or more serious violent offenses; the annual prevalence rate for such offenses dropped sharply after age 17, however, and was lower at age 21 than at age 12 (108).[18] Prevalence rates for serious property offenses also begin to decline at age 17. The National Youth Survey prevalence data, as well as data from other longitudinal studies, suggest that many adolescents may abandon delinquent behavior as they mature (100).

Gender—Male adolescents are more involved in most types of delinquent behavior than female adolescents (48,69,87,100,110,162,165,209,302,386, 452).[19] For serious offenses, male adolescents dominate the statistics (see table 13-4), although it is important to note that male-to-female arrest rate and victimization rate ratios cover a broad range.

The *gender gap in adolescent arrest rates appears to be narrowing* (412). Between 1965 and

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[18] The Monitoring the Future/High School Seniors Survey, which does not usually include adolescents under age 17, found that the proportion of individuals committing at least one robbery or one aggravated assault started to decline at age 17 (303).

[19] Some researchers believe that the extent to which male delinquency exceeds female delinquency is exaggerated (202,294). Whether that exaggeration is minor (as suggested by Hindelang et al. (202) or serious (as suggested by Morris (294)) is uncertain.

In contrast, the gender differential in offending rates and prevalence rates for felony assault (which includes aggravated assault, sexual assault, and gang fights), robbery, and felony theft are similar (102).

1987, the arrest rates for both sexes increased for serious violent offenses and for serious property offenses (412). The arrest rates for female adolescents changed at a greater rate than arrest rates for males. Among individuals under age 18 the ratio of male-to-female arrest rates for serious violent offenses decreased from 11.4 to 1 in 1965 to 7.5 to 1 in 1987. Similarly, the ratio of male-to-female arrest rates for serious property offenses decreased from 6.7 to 1 to 3.6 to 1 over the same period. The significance of these changes—whether they reflect an increase in serious offenses among female adolescents, manifest changing social views that permit or encourage police to arrest more female adolescent offenders, or result from some other factor—is not known.

Racial and Ethnic Background—*Arrest rates* for serious offenses, particularly serious violent offenses, are much higher for black adolescents than for white adolescents and are higher for white adolescents than for other adolescents (American Indians, Alaska Natives, Asians, and Pacific Islanders) (see table 13-5). In 1987, the arrest rate for serious violent offenses was about six times higher for black adolescents under age 18 than for white adolescents under age 18 (see table 13-6).[20]

Table 13-5—Arrest Rates[a] for Serious Offenses Among Persons Under Age 18, by Race, 1987

	Arrests/100,000 population		
Type of offense	Black	White	Other[b]
Serious violent offenses	489.8	75.0	50.8
Murder	10.9	1.6	1.9
Forcible rape	34.3	4.9	2.2
Robbery	231.9	20.0	18.5
Aggravated assault	212.7	48.5	28.1
Serious property offenses	1,933.4	959.8	684.4
Burglary	390.5	229.9	122.6
Larceny/theft	1,268.9	648.0	490.4
Motor vehicle theft	274.0	81.9	72.4
Arson	11.8	11.9	6.1

[a] The *arrest rate* is the number of arrests made in a given population per some population base. The arrest rate here is the number of arrests per 100,000 population of the same age group.

[b] This category includes American Indians, Alaska Natives, Asians, and Pacific Islanders.

SOURCE: U.S. Department of Justice, Federal Bureau of Investigation, *Age-Specific Arrest Rates and Race-Specific Arrest Rates for Selected Offenses, 1965-1988* (Washington, DC: April 1990).

Why arrest rates for black adolescents are higher than those for white adolescents is not entirely clear. Black adolescents are more likely than white adolescents to live in families with low incomes and in urban areas. The arrest rates of adolescents in families with low income are higher than the arrest rates of adolescents of higher incomes; and arrest rates of adolescents in urban areas are higher than the arrest rates of adolescents who live in suburban or rural areas. Even after adjustments are made for income and urban location, however, there is a much greater likelihood that black adolescents who engage in delinquent behavior will be *arrested* for serious offenses (especially for serious violent offenses) than white adolescent offenders. The greater likelihood that black adolescents will be arrested may reflect greater law enforcement efforts in black neighborhoods, greater delinquent activity by individual black offenders, or discriminatory police practices. Huizinga and Elliott attribute the high arrest rates of black adolescents (as compared with white adolescents) to black adolescents' having a greater risk of being arrested regardless of their actual involvement in crime (215).

Data on victimization rates from the National Crime Survey and data on self-reported offending rates from the National Youth Survey suggest that racial differences in adolescent offending are less pronounced than is indicated by data on arrest rates. In the 1987 National Youth Survey for example, the black-to-white ratio in *victimization rates* for serious violent offenses was 2 to 1, very similar to the ratio of 1.9 to 1 for *offending rates* in a similar category (see table 13-6).[21]

In the case of minor offenses among individuals under age 18, the black-to-white ratio in 1987 *arrest rates* for minor offenses other than status offenses was 1.8 to 1 (412). For minor offenses including status offenses, the black-to-white ratio in arrest rates was only 1.5 to 1. Self-reported offending rate data from the National Youth Survey indicate that

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[20] In 1987, black adolescents were 15 percent of the population under age 18 (402) but accounted for 54.6 percent of the arrests for serious violent offenses, 55 percent of arrests for murder, 56.7 percent of arrests for forcible rape, 67.9 percent of arrests for aggravated assault, and 44.8 percent of arrests for robbery by individuals under age 18 (409,415).

[21] There is some evidence that the low racial differential in the National Youth Survey self-report data is partially attributable to differential validity between races in reporting offenses to the survey. When self-report data were checked with official records, the National Youth Survey, as other self-report studies, found a greater degree of underreporting by black adolescents than by white adolescents, particularly for the more serious offenses (214). On the other hand, the exact magnitude of the differential in underreporting is not known (214). Many methodological problems, including small sample size and errors in official records, leaves the issue unresolved (98).

Table 13-6—Rates of Involvement in Serious Offenses: Black-to-White Ratios Reported by Different Sources of National Data on Adolescent Delinquency

	Black-to-white ratios			
	Uniform Crime Reports: Arrest rate, 1987—under age 18[a]	National Crime Survey: Victimization rate, 1987—under age 18[b]	National Youth Survey: Self-reported offending rate, 1976—ages 11-17[c]	National Youth Survey: Prevalence rate, 1976—ages 11-17[d]
Serious offenses	3:1	NA	NSD	1.5:1
Serious violent offenses	6.5:1	2:1[e]	1.9:1	Not collected
Murder	6.8:1	NA	Not collected	Not collected
Forcible rape	7:1	NA	NA	NA
Aggravated assault	11.5:1	NA	NA	NA
Robbery	4.4:1	NA	NSD	2:1
Felony assault[f]	NA	NA	5:2	3:2
Serious property offenses	2:1	NA	Not collected	Not collected
Burglary	1.7:1	NA	NA	NA
Larceny/theft	2:1	NA	NA	NA
Motor vehicle theft	3.3:1			
Arson	NSD	NA	Not collected	Not collected
Felony theft[g]	NA	NA	NSD	NSD

NA = not available; NSD = no significant difference.

[a] *Arrest rates* are the number of arrests made in a given population per some population base in a given time period. The black-to-white ratios for arrest rates here were calculated from arrest rates in the U.S. Department of Justice, Federal Bureau of Investigation, *Age-Specific Arrest Rates and Race-Specific Arrest Rates for Selected Offenses, 1965-1988* (412).

[b] *Victimization rates* are the number of offenses experienced by a given population committed by individuals per some population base over a specified time period. The black-to-white ratios for victimization rates here were derived from unpublished data from the U.S. Department of Justice, Bureau of Justice Statistics, National Crime Survey (421).

[c] *Offending rates* are the number of self-reported offenses that occur in a given population per some population base during a specified time period. The black-to-white ratios for offending rates here are from D.S. Elliott, S.S. Ageton, D. Huizinga, et al., *The Prevalence and Incidence of Delinquent Behavior, 1976-1980* (100).

[d] *Prevalence rates* here are the proportion of individuals in the same population involved in a self-reported offense within a designated time period. The black-to-white ratios for prevalence rates here are from D.S. Elliot, S.S. Ageton, D. Huizinga, et al., *The Prevalence and Incidence of Delinquent Behavior, 1976-1980* (100).

[e] Serious violent offenses included in the National Crime Survey were rape, robbery, aggravated assault, and simple assault.

[f] Felony assault includes aggravated assault, sexual assault, and gang fights.

[g] Felony theft includes larceny-theft, motor vehicle theft, burglary, and possession of stolen goods.

SOURCES: **Uniform Crime Reports:** U.S. Department of Justice, Federal Bureau of Investigation, *Uniform Crime Reports: Crime in the United States, 1987* (Washington, DC: U.S. Government Printing Office, 1988). **National Crime Survey:** U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics, *Criminal Victimization in the United States, 1987*, A National Crime Survey Report, NCJ-115524 (Washington, DC: June 1989). **National Youth Survey:** D.S Elliott, S.S. Ageton, D. Huizinga, et al., *The Prevalence and Incidence of Delinquent Behavior: 1976-1980*, National Youth Survey Report No. 26 (Boulder, CO: Behavioral Research Institute, March 1983).

the black-to-white ratio in *offending rates* for minor offenses is 1.2 to 1, and in the only two offenses for which black-white differences are statistically significant (liquor law violations and drug use), whites have higher offending rates than blacks (102).[22]

Available prevalence data from the National Youth Survey, measuring the number of 11- to 17-year-olds involved in delinquent acts in 1976, also differ by race (see table 13-6). That survey found that the black-to-white ratio in *prevalence rates* for all serious offenses in 1976 was 1.5 to 1. The National Youth Survey also found racial differences in *prevalence rates* for some specific minor offenses: white adolescents had statistically significant higher rates for some offenses (alcohol use, drunkenness, disorderly conduct, and drug use), and black adolescents had statistically significant higher rates for others (carrying a hidden weapon and prostitution) (100).

There is little information on differences in the ethnic origin of adolescent offenders. Hispanics are the only group to be differentiated in national arrest data, and the data are very inexact and cover only a short period of time.[23] In 1986, Hispanic youth under 18 years of age, who represented 9.5 percent of all youths under age 18, accounted for 11.8 percent of juvenile arrests for property crimes and 14.5 percent of arrests for violent crimes (408).

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[22] These findings differ from those of several early self-report studies which found no difference between blacks and whites (63,110,115,171); one found no difference when social class was controlled (162). Other self-report studies found slight racial differences (203,386), or differences only in prevalence (452).

[23] Hispanics were included in the Federal Bureau of Investigation's Uniform Crime Report program as of 1980. The Federal Bureau of Investigation stopped collecting data by Hispanic/non-Hispanic categories at the end of the 1986 reporting year because of concerns about the accuracy of the data.

Hawaii has examined its adolescent population in relation to delinquent acts and found a disproportionate incidence of arrests among Native Hawaiians. Twenty-four percent of the Hawaiian population under age 18 are Native Hawaiians, yet State data indicate that Native Hawaiians account for 35 percent of all arrests among this age group (287).[24]

Socioeconomic Status—The most common measure of social class of adolescents is parental socioeconomic status (240).[25] Reviews of this factor have concluded that some—albeit limited—evidence suggests that delinquent behavior is somewhat more likely and more frequent in adolescents from low socioeconomic backgrounds than in adolescents from higher socioeconomic backgrounds, but that the association is restricted to the more serious offenses (48,268,353,389).[26] Further, studies have found that delinquency occurs in all social groups (268,353).

Findings concerning the relationship between socioeconomic status and adolescent delinquency differ depending on the source of information used by researchers. Studies based on official arrest or court records have been more likely than studies based on self-reports to find an association between socioeconomic status and delinquency (268,353). Studies based on self-reports of nonserious delinquent behaviors generally have found little or no relationship between parental socioeconomic status and adolescent delinquency or a weaker association than studies based on official reports have found (353). A recent major study based on self-reports of *serious* offenses, however, did find a relationship between socioeconomic status and delinquency, mainly serious assaultive offenses (99). Not only did adolescents from families of lower socioeconomic status report committing more serious offenses than adolescents from middle-class and working-class families, but a disproportionately high number of adolescents from families of lower socioeconomic status reported involvement in serious offending (100). This study did not find any difference between middle-class and lower class adolescents with respect to measures of minor delinquent activities, however (100).

Whatever relationship between socioeconomic status and adolescent delinquency there is seems to be relatively weak. Loeber and Dishion's meta-analysis of self-report and official measures of a number of early predictors of adolescent delinquency (e.g., child problem behavior) concluded that socioeconomic status is the lowest ranking predictor for delinquency and recidivism (268).[27] The fact that the relationship between parental socioeconomic status and adolescent delinquency is a weak one suggests that the association is indirect. A recent study based on self-reports found that economic hardship does not have a direct effect on delinquent and drug-using behaviors of males and females in the 9th through 12th grade but that it does have an indirect effect (259). That study measured the effects of the current decline in parental economic status in the Midwest Farm Belt on adolescents' behavior.[28] Most of the adolescents were members of working-class and lower middle-class families. Economic hardship resulted in an increase in inconsistent parental discipline, and this in turn increased delinquent and drug-using behavior, particularly in males. This finding is consistent with that of other studies which find that delinquency is not associated with social class per se but is probably mediated by parental problems associated with low socioeconomic status (163,258,259,353,389).

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[24] Native Hawaiians tend to have lower incomes than non-Native Hawaiians and are overrepresented by 43.1 percent in the poverty population (287). Since arrests for delinquent behavior are also higher among persons with low incomes (85), the relationship of being a Native Hawaiian to arrests for delinquent behavior, as with black adolescents, becomes entangled with the effects of low income and poverty on arrests for delinquent behavior.

[25] Unfortunately, information on parental socioeconomic status is not routinely reported with Uniform Crime Report arrest data or the National Crime Survey victimization data; therefore, researchers must do special analyses to determine the relationships between socioeconomic status and arrests. In the light of regular reporting of racial data, this lack of regular reporting of socioeconomic status data in the Uniform Crime Report and in the National Crime Survey may skew interpretations of the data.

[26] Kercher is more restrictive in his review and concludes that ''empirical research consistently finds little or no relationship between parental socioeconomic status and the illegal behavior of teenagers whether one measures socioeconomic status by official recorded or self-recorded crimes. There is only a strong relationship under very restricted circumstances; specifically for young black adults and when socioeconomic status is measured by education and employment rather than by income and occupation, and more for violent than for property crimes'' (240).

[27] In terms of median relative improvement over chance, Loeher and Dishion found, the predictors for *adolescent delinquency* in rank order were 1) composite measures of parental family management techniques; 2) child problem behavior; 3) stealing, lying, or truancy; 4) criminality or antisocial behavior of family members; 5) poor educational achievement; 6) single measures of parental family management techniques; 7) separation from parents; and 8) socioeconomic status. The rank order of predictors for *recidivism* were 1) stealing, lying, or truancy; 2) child problem behavior; 3) criminality or antisocial behavior of family members; 4) prior delinquency; and 5) socioeconomic status (268).

[28] Lower class people have been shown to suffer the greatest psychological distress during economic declines (211).

One explanation offered for the disproportionate representation of black adolescents in delinquency is the economic deprivation in which most black adolescents live. As discussed elsewhere in this report, approximately half (52 percent in 1988) of black adolescents live in families with incomes below 150 percent of the Federal poverty level (about $15,000 per year for a family of three); this compares with the one out of five (17 percent) white non-Hispanic adolescents who live in families with such low incomes.[29] Further, in addition to considering basic income levels, it is important to consider other characteristics of the social environments of poor black adolescents, particularly those who live in urban areas (see, e.g., (85)). Many poor black adolescents are likely to live in areas with disproportionately high levels of neighborhood unemployment, persistent poverty, and crime (85). This may be a factor in why several studies, even one using adolescent self-reports (100), have found that poor black adolescents are somewhat more likely to be delinquent than similarly poor nonblack (white) adolescents (220,398,458).[30]

It may also be important to consider differences among black adolescents from different national and historical circumstances. For example, Dembo has suggested that the higher rates of family stability among West Indians *may* protect against the risk of delinquency associated with low income (85). It is important to note that little is known definitively about the causes of delinquency among black adolescents, and that vast amounts of knowledge are obscured when data on delinquency are reported solely by racial and ethnic group, without consideration of family, neighborhood, socioeconomic, and perhaps other, factors.

Urban/Suburban/Rural Areas—Arrest, offending, and prevalence rates are difficult to compare among urban, suburban, and rural areas. Arrest rates refer to the location of the police agency making the arrest and not necessarily the location of the offense or the residence of the offender, and offending and prevalence rates refer to the residence of the offender. Nonetheless, it appears that for most offenses, serious and minor, urban areas experience higher incidence, offending, and prevalence rates than suburban areas, and rural areas have the lowest rates of all (100,415). For some minor offenses, including liquor law violations and runaway violations, urban, suburban, and rural areas have fairly comparable arrest rates and self-reported offending rates (100,415).

Other Factors Associated With Delinquency

Information on other—i.e., nondemographic—factors linked to delinquency is derived primarily from community-level research studies. The discussion that follows is based mainly on literature reviews that examined multiple studies of factors associated with delinquency. The specific reviews consulted for a factor are noted in the section devoted to that factor.

The usefulness of incomplete or controversial information for the implementation of prevention and treatment programs is doubtful, so only those factors whose association with delinquency is supported by substantial empirical evidence are discussed (see table 13-7).[31] [32]

Theoretical Bases of Studies That Explore Why Adolescents Commit Offenses—Studies investigating why adolescents and others commit offenses typically have some theoretical basis. Many theories have been proposed over the years, but all of them are based on one of three different premises (433).

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[29] See ch. 18, "Issues in the Delivery of Services to Selected Groups of Adolescents," in Vol. III.

[30] The latter studies used official records to measure delinquency. As noted above, arrest rates for black adolescents are disproportionately higher than black adolescents' self-reported involvement in delinquency. Elliott and colleagues found, however, that at the higher frequencies and for more serious offenses, self-reports and police data coincide (100).

[31] Although the factors discussed here mainly relate to serious offenses, the same factors are often associated with minor offenses; the timing and the strength of the association for serious offenses, however, may differ from that for minor offenses. Family background appears to be related to the involvement of young children and adolescents in the commission of minor offenses but not of serious offenses. Factors related to societal pressures, such as peer influence, appear to be more related to the involvement of older adolescents and to the commission of larceny-theft and other serious offenses. A young person who has been exposed to poor family influences may be more susceptible to societal influences if and when exposed to them (98).

[32] Most research on the correlates of offending focuses on what factors differentiate offenders from nonoffenders and contrasts offenders and nonoffenders in one age range. Very little research examines how specific factors are correlated with specific stages in a criminal career (onset, duration, and cessation).

Table 13-7—Selected Factors Associated With Serious Offending by Adolescents[a]

Factors	Relative strength of association with serious offending[b]
Family factors	
Lack of parental supervision	Strong
Lack of parental involvement[c]	Modest—strong
Parental rejection	Strong
Poor parental disciplinary practices	Weak—modest—strong
Familial criminal behavior	Medium—strong
Poor marital relations[d]	Medium for serious offenses
Parental absence due to divorce or separation	Small
Large family size	Only when associated with low income and poor housing and for males
Multivariate combination of family factors	Strongest—next to strongest[e]
Child abuse and neglect	Moderate—for delinquency in general: not significant for delinquency characterized by violence
Early socially disapproved behaviors	Strong—especially for serious offenses and recidivism
Attention deficit hyperactivity disorder (ADHD)	Moderate
Learning disability	Only in combination with multiple other factors
Low IQ, especially lack of verbal ability	Strong
Poor school performance	Moderate
Delinquent peers	Strong—during adolescent period
Neighborhood/community	Weak—strengthened when associated with other factors
Biological factors	Inconclusive
Alcohol use prior to offending	Moderate
Drug use prior to offending	Moderate—weak
Guns	Increase severity of outcome

[a] The factors listed here are also associated with minor offenses, but the strength of the association is not identical.

[b] The strength of the association of each factor with serious offending by adolescents was determined by OTA's analysis of published reviews. When reviewers disagreed as to their assessment of the strength of the relationship between a particular factor and delinquency, the range of various reviewers' descriptors (e.g., weak—modest—strong) is listed. The strength of the relationship between alcohol use and drug use prior to offending and gun use was determined by an analysis of survey data.

[c] Measures of lack of parental involvement include neglect, indifference, ignoring a child, and not taking the child on outings.

[d] Measures of poor marital relations are marital conflict, marital discord, marital disharmony, and excessive quarreling.

[e] Multivariate combinations of family factors have the strongest relation to offending according to some researchers (268).

SOURCE: Office of Technology Assessment, 1991.

One premise, on which the current theory of deterrence and the historical classical and neoclassical theories of criminology are based, is that *criminal behavior is freely chosen and that individuals make rational decisions to promote their best interests*. In the late 1960s, deterrence theory revived a classical approach to controlling criminal behavior that had been dormant after 100 years of application. The increase in restrictive and punishment-oriented responses to juvenile offenders (e.g., increasing the length of incarceration for juveniles sent to training schools) in recent years exemplifies the punishment component of deterrence theory (246).

A second premise, on which social reaction theories, conflict theories, and Marxist theory are based, is that *crime and the characteristics of criminals are defined by society* through criminal law rather than by the behavior of individuals (433). According to this premise, the reason that most people convicted of crimes are poor is because the actions typical of poor people are labeled as crimes and not because poverty causes crime. Furthermore, laws governing actions most commonly committed by poor people (e.g., armed robbery) are strictly defined and enforced, while laws governing actions typically committed by the middle and upper class (e.g., embezzlement) are not strictly defined or enforced.

The third premise, on which modern positivist theories are based, is that *human behavior, including criminal behavior, is partially determined by forces beyond individual control*. Positivist theories (e.g., learning theories, social control theory, strain theory, and ecological approaches) call for use of the scientific method to study the biological, psychological, and social characteristics of criminals in order to identify the causes of criminal behavior.[33] Some researchers have integrated one or more positivist theories to explain the etiology of offending (100).

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[33] *Learning theories* of criminal behavior are based on how learning takes place. Learning refers to habits and knowledge that develop as a result of the experiences of the individual in adjusting to the environment. *Social control theories* focus on the restraining or controlling forces imposed on individuals. These theories propose that individuals who commit crimes do so because of weakness of forces restraining them from doing so. *Strain theories* propose that there are certain socially generated pressures or forces that drive people to commit crimes. These pressures are not evenly distributed in society but are most severe among groups with the highest crime rates. *Ecological approaches* focus on the characteristics of areas.

Neighborhood/Community Factors Associated With Delinquency—It is clear that the social and physical environments have an influence on delinquent behavior.[34] A consistent finding is that official rates of delinquency vary with the socioeconomic conditions of geographic areas—i.e., delinquency rates are high in areas of low socioeconomic status (77,163,372). Early research indicated that the pattern of delinquency rates in inner-city areas stayed constant over time (372), but later analysis showed that variations did occur and reflected demographic changes (57). An unresolved question is why offense rates in communities change over time and to what extent such change is a function of changes in the communities or individuals living in the communities (336).

Among boys of low socioeconomic status, those who live in areas with high offense rates are more likely to become delinquent than those who live in areas with low offense rates (336). Self-report data indicate, however, that although poor children who live in poor areas are more delinquent than other children, they are only marginally more delinquent than children who live in more affluent areas (100). One reason that adolescents living in poor neighborhoods have a higher rate of officially recorded delinquency than adolescents in other types of neighborhoods may be that they are the object of greater surveillance by police and local residents (163).

Only a few studies have examined the effect of neighborhood/community on the delinquency of individual adolescents (163,240). Most of these studies have focused on the area's socioeconomic status and not included other aspects of a neighborhood/community that might affect delinquency (240). In contrast, one recent rigorous analysis divided the characteristics of neighborhood/community into four categories: 1) economic level, 2) level of community organization/criminal subculture,[35] 3) level of community participation in organizations, and 4) residential stability of the community (383). Even though this study was well-controlled for measurement errors, none of the four categories of neighborhood characteristics showed more than weak direct and indirect effects on officially recorded or self-reported crime of adolescents (240).

Possibly, a neighborhood incrementally affects the delinquency rate by interacting with individual circumstances. Communities with high delinquency rates, for example, often have a disproportionate number of households headed by females who have incomes at or below the poverty line and who have to work outside the home. This may weaken parental supervision. The weakening of parental supervision and the presence of an antisocial peer culture in the neighborhood may reinforce potential delinquent tendencies and behavior (336).

Family Factors Associated With Delinquency—Researchers have studied the association of many factors in the family environment with delinquency. While most family factors, for example lack of parental involvement, have been the object of attention for many years, the examination of the relationship of child abuse and neglect to delinquency is relatively recent.

Selected Family Factors—Several studies have established a strong association between certain family variables—e.g., a lack of parental supervision—and juvenile delinquency and adult crime (48,240,269,353,389). Evidence from official records[36] and self-reports agree that such family characteristics have a concurrent association with delinquency and a predictive association with later delinquent behavior and often with adult crime (269,389).[37]

Different researchers and reviewers categorize family variables in different ways. Therefore, no one categorization fits all reviews. The family variables listed in table 13-7 are as follows:

- lack of parental supervision,
- lack of parental involvement,
- parental rejection,
- poor parental disciplinary practices,
- familial criminal behavior,

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[34] It is important to note that the interventions discussed later in this chapter concern the prevention or alteration of delinquent behavior on the individual level. Information on the effectiveness and cost-effectiveness of community interventions to reduce delinquency and crime is sparse and inconclusive (336).

[35] *Criminal subculture* refers to the extent to which a community tolerates social disorder and criminal behavior (383).

[36] Official records include arrest records, court records, and records of detention and correctional institutions.

[37] For a discussion of parents and families' influence on adolescent health, see ch. 3, "Parents and Families' Influence on Adolescent Health."

- poor marital relations,
- parental absence due to divorce or separation,
- large family size, and
- a multivariate combination of family factors.

This list was adapted from Loeber and Stouthamer-Loeber (269).[38] Child abuse and neglect are not included in this list and are therefore considered as factors in a separate discussion below.

Any arrangement of family factors listed above based on the strength of their relationship with adolescent delinquency is open to question. As table 13-7 shows, agreement about the strength of the association between each family variable and delinquency in the literature reviews OTA examined was considerable but not complete. The lack of complete consensus is not surprising. For one thing, the reviews included different studies for the most part, and the sample size, population, and findings among the studies reviewed varied. The overlap of studies among reviews was small, a situation due in part to the huge literature on the topic and to different criteria for inclusion adopted by each review. Moreover, each review used a different method of analysis of studies to rate the strength of the relationship between the variable and delinquency. Three of the literature reviews of family factors that OTA discusses in depth were traditional "narrative" reviews[39] and did not specify their method of analysis (48,240,353); Loeber and Stouthamer-Loeber used a meta-analysis (269).[40]

Loeber and Stouthamer-Loeber concluded from their meta-analysis that the family variables that were most strongly associated and were the most powerful predictors of delinquency were the lack of parental supervision, the lack of parental involvement, and parental rejection[41] during the adolescent period and earlier (269).[42] The authors of the other literature reviews agreed that the lack of parental supervision had a strong association with delinquency, and all but one concurred that parental involvement had a strong association with delinquency. Snyder and Patterson described the strength of relationship between family involvement and delinquency as significant but modest, basing their conclusion on an analysis of variance of five longitudinal and cross-sectional studies (389). Kercher, who performed a traditional narrative review, noted that the strength of the effect of family supervision and family involvement varied among the studies examined; studies using more refined measures of attachment found stronger relationships (240).

The authors of most of the literature reviews agreed with Rutter and Giller's narrative review that the methods of disciplining and the severity of punishment may not be as important a risk factor in delinquency as the "extent of supervision, the clarity of parental expectations, and the efficiency of disciplinary methods" (353). Loeber and Stouthamer-Loeber's meta-analysis concluded that of the wide variety of childrearing practices the meta-analysis included under the term "discipline" (physical punishment and deprivation, nagging and scolding, lack of reasoning, love withdrawal, strictness and consistency, and fairness of punishment), lax and erratic discipline and strict and punitive discipline were most closely, although weakly, related to delinquency (269). Parental discipline of adolescents and younger children also showed a significant, but weak, relationship to later delinquency and aggression (269). Snyder and Patterson's review also concluded that poor disciplinary practices, which were described as lax or neglectful, erratic or inconsistent, overly harsh or punitive, or harsh physical punishments were significant but modest contributions to delinquency (353).

On the other hand, Kercher placed discipline as one of the two most important "features of family life in current criminological research" (239). He attributes the finding by Loeber and Stouthamer-Loeber that discipline has a weaker effect on delinquency than supervision, involvement, and affectionate ties (269) to the need for more refined measurements of parental discipline and the necessity to control for the reciprocal effects of delinquency on discipline (240).

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[38] Not all reviews examined by OTA analyzed all these variables.

[39] A *narrative review* of the literature bases its conclusions on a subjective analysis by the reviewer. Among the many problems in a narrative review that may result in a misinterpretation of study findings is the possible lack of a systematic survey of the literature base and different subjective weighings of studies (400).

[40] A *meta-analysis* is a statistical or quantitative analysis of a large collection of results from individual studies for the purpose of integrating the findings (159). In the meta-analysis used in the study by Loeber and Stouthamer-Loeber, the authors constructed a relative-improvement-over-chance measure to determine the strength of the relation between each family variable and delinquency. This measure was intended to standardize for differences across studies in the base rate of delinquents and the selection ratio used by the researchers.

[41] Parental rejection was included under the category of parental involvement in the other reviews examined.

[42] The amount of supervision was associated with the frequency and the variety of delinquent offenses (269).

Snyder and Patterson suggest that poor and erratic disciplinary practices may affect the development of delinquent behavior directly by failing to correct for antisocial behavior and by providing young people with aggressive models of problem solving (389). Such practices can also have an indirect effect on delinquency, since youngsters exposed to aggressive modes of discipline may adopt the same behavior in their relations with peers and others. Such adolescents may be more likely to be rejected by most peers and resort to associating with delinquent peers (389).

There are varying opinions about the strength of the linkage between familial criminal behavior and adolescent delinquency. On the one hand, Loeber and Stouthamer-Loeber judged parental and sibling criminal behavior during adolescence and earlier to be a medium strength family variable with respect to delinquency and adult crime (269). On the other hand, Visher and Roth consider criminal activity on the part of parents, siblings, and even grandparents to be strongly associated with delinquency and adult criminal behavior (48,432). This finding agrees with Ruttler and Giller's labeling of familial criminal activity as the "most stable and consistent family characteristic" associated with delinquency (353). A recent analysis found that a parent's criminal behavior and drunkenness does not directly affect delinquency but disrupts the family process of control by increasing the inconsistency of discipline and the use of force and reducing effective supervision (258).

Poor marital relations between parents during adolescence and earlier are medium strength family variables with respect to adolescent delinquency and adult criminal behavior (269,353,389).[43] The discord involved in some divorces and some separations, as well as the conflict between parents in intact homes, increases the risk of adolescents' involvement in serious, but not in minor, delinquent acts.

One of the many, as yet unproven, reasons advanced as to why family discord increases adolescent delinquency is that the energy and time consumed by parents in conflict diverts parents from providing adequate discipline and supervision to their children (48,269,353). Family discord may interfere with the establishment and maintenance of healthy parent-child relationships, or mothers and fathers in conflict may provide an example of antisocial behavior for some children to copy (48).

Parental absence due to divorce or separation has been found to have either a small (48,269) or inconsistent (48) association with adolescent delinquency. Neither parental absence caused by parental death or hospitalization nor separation from parents at an early age is significantly associated with delinquency (48,129). In general, parental absence appears to have a weaker linkage with delinquency than poor marital relations does (269,353,389) and may not be associated with delinquency directly but rather through its connection with marital conflict and disharmony (353).

The reviews that examined family size as a variable found large family size was linked with other factors in its association with male delinquency but not female delinquency (48,269,353).[44] Large family size appears to be related to increased delinquency when associated with low income and poor housing (129), but not when associated with middle-class families (48). It may be that large family size is often accompanied by inappropriate discipline and supervision, which may result from the insufficient time and financial resources and overcrowding that accompany low-income and poorly housed families (48,269). Another possibility is that childrearing may be delegated to inexperienced older children in large, low-income families (269). In addition, in a larger family there is increased risk of exposure to a delinquent sibling, a variable associated with delinquency (48,269). Another unverified possibility is that the probability of inheriting characteristics associated with criminal behavior (e.g., low intelligence) or having a delinquent sibling increases as the size of a family increases (48).

In summary, it appears that family variables that directly affect family-child interactions—e.g., parental rejection, lack of parental supervision, lack of parental involvement, and poor parental disciplinary practices—appear to have a strong concurrent and predictive association with delinquency. Family variables that do not directly affect family-child relations—e.g., poor marital relations, divorce or separation, and family size—appear to be less strongly associated with delinquency and may act indirectly by interfering with the ability of parents to supervise or be involved with their children.

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[43] Poor marital relations have been variously described in different studies (e.g., in terms of marital conflict, marital discord, marital disharmony, and excessive quarreling).

[44] Large family size in some studies was more than two children (269).

Family variables associated with adolescent offending have been investigated in combination as well as one at a time, and the *cumulative effect of several family risk variables has been found to be a better predictor of delinquency than any single variable alone* (269,389). A review by Loeber and Dishion found, for example, that single family variables improved the prediction over chance on the order of 20 percent, while the use of multiple family variables improved prediction over chance levels by 50 to 80 percent (268). Snyder and Patterson noted that 10 to 20 percent more variance is "accounted for by multivariate combinations of family variables than any one family variable alone" (389). One cannot definitively ascertain from available research, however, which combinations of risk factors are most predictive of later delinquency or adult crime (269).

Child Abuse and Neglect[45]—Literature reviews of early studies of the relationship between child abuse and neglect and delinquency emphasize that most studies are flawed methodologically[46] and that there are extreme differences among the research efforts (150,448). The types of behavior labeled as delinquency vary widely among the studies, as do the definitions of child abuse and neglect.[47] Most of the studies lacked appropriate comparison or control groups. Despite these methodological flaws, however, the *weight of the evidence indicates a relationship between child maltreatment and delinquency.*

In early studies of the relationship between child abuse and neglect and delinquency that used a retrospective design, child abuse and neglect were consistently found to be related to delinquency (150,448).[48] In studies reviewed by Garbarino and Plantz and Widom using retrospective designs, 8 to 88 percent of delinquent adolescents reported having been abused, with the estimates generally ranging between 8 and 29 percent[49] (150,448). Variations in the studies reviewed included sample size, the number of times the delinquent had been abused, the age when queried about abuse, the specific type of abuse, and the site of query (e.g., diagnostic center and school, private residential treatment program, detention center, training school) (150,448).

Early longitudinal studies of abused and neglected children found that about 10 to 17 percent of individuals who had been abused or neglected as children became delinquent (150,448).[50] Only two of the longitudinal studies reviewed had a comparison group. Garbarino and Plantz reported that one study with a comparison group reported that almost 10 percent of the children who were abused or neglected were subsequently reported as delinquent compared with 2 percent of controls during the same time period (150). Widom reported that another study found that 15 percent of neglected children and 10 percent of abused children committed serious offenses in childhood as compared with 7 percent of children defined as loved in the study (448). In this study, parental rejection was found to be more strongly related to delinquency than child abuse or neglect (279).

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[45] Child abuse and neglect are considered separately from other family variables because the literature reviews evaluating studies of family variables did not include the studies included in reviews of child abuse. Although studies of discipline are included in reviews of family variables associated with delinquency, more often than not the disciplinary action is "normatively legitimate corporal punishment" which is differentiated from physical child abuse (393). One of the many definitions of physical abuse is "an assault on a child by a parent which exceeds the level of violence allowed by legal and other norms" (393). For further discussion of child abuse and neglect, see ch. 3, "Parents and Families' Influence on Adolescent Health," in this volume. That chapter also discusses the effects of various styles of parenting.

[46] "Does Violence Beget Violence? A Critical Examination of the Literature," by Cathy Spatz Widom, includes a scholarly analysis of the methodological problems of the literature on child abuse and neglect and violence (448).

[47] Although a meta-analysis might clarify some of the association between child abuse and neglect and delinquency, noncomparability of the key variables in the literature has interfered with such an analysis (450).

[48] Such retrospective studies identify samples of delinquent youths and then use reverse record checks to determine the incidence of abuse or neglect in their background.

[49] Calculations of the rates of child abuse and neglect in the general population are extremely imprecise due to the lack of data, but even the highest estimates allow the above conclusion (150).

[50] Such studies followed up children who were abused or neglected to see if they were involved in delinquency at a higher rate than adolescents who were not abused.

One review of studies on the association of child abuse and neglect to delinquency characterized by violence found a relationship between child abuse and neglect and violent behavior in studies that compared violent offenders with nonviolent offenders (150). A relationship between abuse and violent behavior is also suggested by findings that delinquents who were abused and neglected are involved in violent offenses more often than those who were not (150). Another review found contradictory findings among the studies reviewed (448).

A recent prospective study of the relationship between child abuse and neglect and delinquency has overcome many previous methodological problems (449). The findings are consistent with the previous literature in terms of the percentage of maltreated children who become delinquent and the fact that the majority of maltreated children do not become delinquent (451). The study found 26 percent of abused and neglected children had a juvenile record in contrast with 16.8 percent of the controls. Black children who were abused were particularly at risk for delinquency (451). In comparison to controls, individuals who were abused or neglected as children had more arrests as adults (29 v. 21 percent) and more arrests for any violent offense on a juvenile or adult record (11 v. 8 percent)[51] (449).

Individual Factors Associated With Delinquency—In addition to examining variables in the external environment, i.e., in the neighborhood and in the family, researchers have inquired into the contribution of individual characteristics and individual behaviors to delinquency.

Early Expressions of Socially Disapproved Behavior(s)—Reviews of studies of the linkage between early expressions of socially disapproved behaviors and delinquency conclude that *repeated expressions of antisocial behaviors*[52] *by children in preadolescence and early adolescence are strongly associated with delinquency*—especially serious delinquent behavior and recidivism—in later adolescence (48,269,353). Studies have consistently found high rates of delinquency among adolescents who as children or young adolescents displayed behaviors described as aggression, stealing, lying, truancy, acting troublesome in school, fighting, being aggressive-disruptive, daring, dishonest, nervous, antisocial, or destructive or evidencing poor socialization.

One meta-analysis concluded that aggression and stealing in childhood were better predictors of adolescent delinquency than any other of the early antisocial behaviors (268). The time at which the antisocial behavior is measured apparently affects the strength of the relationship. A few studies have found, for example, that aggressiveness in early adolescence is more highly predictive of delinquency at a later age of adolescence and adult criminality than is aggressiveness in early childhood (269).

The association between early antisocial behaviors and delinquency has been found to hold in many places where young children can express antisocial behavior (e.g., at home, in school, and in clinics) when different outcome measures of official records of delinquency as well as self-reports are used and when different measures of the early behavior of children (self-reports, parent ratings, teacher ratings, and peer ratings) are employed (48,269,353). For that reason, the ability of antisocial behaviors to predict adolescent delinquency is somewhat generalizable. This generalizability is limited to white males, though, because only a few studies have involved white females, and even fewer have examined the early behavior of black and other populations (48,268,269,353).

Although there seems to be a general consensus among researchers that *problem behaviors in childhood are a predictor of delinquency,* there is less consensus about the relative importance of this predictor. One reviewer rates antisocial behavior in childhood just after poor family management as the best predictor of future delinquency (268). Other researchers rate antisocial behavior in childhood before family variables (344,345). Still other researchers regard antisocial behavior in childhood and family variables as being of equal importance as predictors of delinquency (119).

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[51] Abused and neglected children also began their official criminal activity approximately 1 year earlier than the control subjects and had approximately two times the number of offenses. The increased risk associated with childhood victimization is primarily with property crimes and status offenses, such as runaway, truancy, and ungovernability (449).

[52] Antisocial behaviors by children and adolescents are also known as conduct problems in the criminology literature and are characteristic of the psychiatric diagnosis of conduct disorder (see box 13-A).

The efficiency of screening children with antisocial behaviors for some form of intervention is partially compromised by the large number of children who exhibit such behaviors and who do *not* become adolescent or adult offenders (48). Furthermore, the adolescent who commits only one delinquent act is quite similar in behaviors to the child who commits no delinquent act (353). On the other hand, the child who will eventually become a chronic delinquent or an adult criminal often differs in behaviors from the child who does not become a delinquent. It has been suggested by a review of the literature that two-thirds to almost all eventual chronic delinquents can be characterized in elementary school by their behaviors (269). However, this conclusion does not necessarily mean that all children who exhibit antisocial behaviors in elementary school will go on to become chronic delinquents.

Attention Deficit Hyperactivity Disorder—Attention deficit hyperactivity disorder (ADHD) is a childhood disorder that has been defined in numerous ways. The definition in the latest version of the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders*, known as DSM-III-R, is presented in box 13-A. According to this definition, ADHD is characterized by "developmentally inappropriate degrees of inattention, impulsiveness, and hyperactivity" (10).

ADHD and antisocial behaviors or conduct problems are highly intercorrelated, and some researchers believe that they could be grouped into a single behavioral disorder category that would also include learning disabilities (125,331).[53] Other researchers believe that ADHD and conduct problems are both biological correlates of delinquency that reflect a developmental lag within the central nervous system (331). However, the factors that are strongly correlated with ADHD differ from the factors that are strongly correlated with conduct problems. A number of studies have found that ADHD is linked to poor cognitive and academic functioning, while early aggressiveness is linked to poor parenting factors and low socioeconomic status (125). The problem has a very early age of onset—from 2.9 to 5 years of age (125,331).

Cross-sectional and prospective longitudinal studies have found that children with ADHD have relatively high rates of delinquent behavior and of criminal behavior in later life (125,331). For example, a matched control study that followed males from 9 years of age until they were 18 years of age found that 20 percent of the ADHD males were arrested during that period in comparison with 8 percent of the controls (125).

The correlation between ADHD and delinquency was corroborated in a rigorous controlled study that collected information through parental interviews, teacher and peer ratings, and biological measures of psychomotor impulsivity to assess ADHD problems in males of 8 and 10 years of age (125). All the measures of ADHD significantly predicted juvenile convictions between the ages of 10 and 16 independent of measures of conduct problems and also with additive effects. ADHD was particularly predictive of early convictions; conduct problems were more predictive of self-reported delinquency, adult convictions, and recidivism. Both ADHD and conduct problems were significantly predictive of chronic offenders.

Learning Disabilities—Adolescents with learning disabilities[54] have higher rates of officially recorded[55] delinquency than adolescents without learning disabilities (50,255,331); they also have higher rates of recidivism and parole failure (50,255) and commit more serious offenses at rearrest (50) than those without learning disabilities. Although prevalence rates for delinquent acts vary widely, *individuals with learning disabilities compose a disproportionate segment of the delinquent population*, even when factors of age, race, and socioeconomic status are held constant (50,255). The estimated prevalence rate of learning disabilities in the delinquent population ranges from less than 12 percent to more than 70 percent in different studies. The wide range of estimates is due to the variety of definitions of learning disabled and to different methods of assessing the condition (50).

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[53] Learning disabilities, which have not been well defined, are discussed in the next section below.

[54] *Learning disabilities* have not been well defined, and diagnostic criteria are not precise. The National Conference on Learning Disabilities agreed that learning disabilities "is a generic term that refers to a heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning, or mathematical abilities, or of social skills" (234). These disorders are intrinsic to the individual and presumed to be due to central nervous system dysfunction (234). Although some experts consider learning disability a biological factor connected with delinquency, others think the biological link needs much more investigation before reaching this conclusion (331).

[55] Although children with learning disabilities violate the law at the same rate as other children, they are overrepresented in official arrest and juvenile court statistics (381); many believe that such children receive differential treatment by the judicial system (50).

Many explanations for the linkage between learning disabilities and delinquency have been proposed, but no explanation has been firmly established. It is likely that a learning disability by itself is not sufficient to foster delinquent behavior but that a learning disability in complex interaction with multiple factors increases the risk of such behavior (50,255). One hypothesis is that individuals with learning disabilities have difficulties with language, social perception, and social relationships—attributes that place them at higher risk of delinquent behavior, particularly when associated with other factors associated with offending, such as low IQ, parental criminality, and poor parenting practices (50).

Low IQ and Poor School Performance[56]—Reviews of numerous studies conclude that low intelligence level as indicated by IQ[57] (48,326) and poor school achievement (48,240,268) are associated with and predictive of delinquent activity when measured by self-reports and official records, regardless of race or social class (353).[58]

Delinquents generally have mean IQs of about 92—8 points lower than the mean IQ of the general population (326). Delinquents' lower IQ is attributed specifically to poor verbal abilities: about two-thirds of delinquents are lacking in verbal skills as measured by standardized tests (326). Low verbal skills may deter a child from academic achievement, thereby contributing to delinquency (326). Or the lack of verbal skills may be more complex and underlie such "personality-cognitive" functions as interpersonal problem-solving and moral reasoning, which can contribute to delinquent behavior (326).

Poor educational achievement is moderately associated with delinquency regardless of race or social class (48,240,268).[59] One review found that by the end of elementary school, low achievement, poor vocabulary, and poor verbal reasoning are the best predictors of future adolescent delinquency (268). During the high school years, this review found, low grade point average and not being promoted are the best predictors of future adolescent delinquency and adult criminality (268).

School failure in high school and dropping out of school overlap logically. The literature shows that dropouts are more delinquent than nondropouts when in school, but delinquency among dropouts declines after they leave school. Most researchers agree that the offense rates of dropouts and high school graduates converge by the midtwenties at the latest (181).

Association With Delinquent Peers—Empirical evidence showing that association with delinquent peers by young adolescents is positively related to delinquent behavior when the adolescents become older and to criminal activity when they reach adulthood is consistent (48,109,125,240,315).[60] Indeed, involvement with a delinquent peer group by young adolescents emerged as the strongest predictor of delinquency among older adolescents in several studies (106,268,313).

Studies have also shown that involvement with a delinquent peer group serves to maintain delinquent status (48,125,315). In fact, a high percentage of delinquent behavior is carried out with peers (111). Researchers disagree, however, about whether exposure to delinquent behavior promotes delinquent behavior, or whether delinquent behavior leads to the choice of delinquent friends (240).

A recent analysis of the onset of delinquent behavior sheds some further light on the debate. The study concluded that for adolescents ages 11 to 17, "exposure to delinquent friends preceded minor delinquent behavior in a majority of the cases and preceded serious delinquency in nearly all cases'' (109).[61]

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[56] For a general discussion of schools and school performance, see ch. 4, "Schools and Discretionary Time," in this volume.

[57] Intelligence is a controversial construct; most studies use "intelligence quotients" (IQs) as measured by standardized tests as an indicator of intelligence.

[58] Although intelligence and school achievement are not the same, several studies have found that they are strongly associated (268). Poor school performance sometimes results from problems such as ADHD or learning disabilities that are not related to intelligence.

[59] None of the studies in these two reviews overlapped.

[60] For example, one longitudinal study found that 59 percent of males who were involved with delinquent peers at age 14 had a conviction record at age 25 in contrast to 25 percent of other males who did not have delinquent associates (19).

Biological Factors—Many biological factors—genetic, biochemical/hormonal, physiologic, and neurophysiologic—have been investigated for their association with delinquent behavior (331).[62] The genetic contribution to delinquency has been examined by studying twins (126,293). Studies of twins are conducted on the premise that identical twins are more similar in heredity than fraternal twins. If identical twins are more similar in their delinquent history than fraternal twins, some genetic influence on delinquent behavior is assumed. The effect of environment on delinquent behavior, however, cannot be discounted in studies of twins who have not been reared apart because identical twins typically are raised more similarly and evoke similar responses from the social environment than fraternal twins (293). Although the weight of the evidence from studies of twins is strongly suggestive, it is not conclusive; studies to date have not been able to sort out the effects of heredity from the effects of environment.

The linkage of genetic factors to delinquency has also been examined by studying twins and other children who have been adopted outside of their biological family. Adoption studies have found that there is a positive relationship between antisocial behavior in adoptees and antisocial behavior in biological parents, but the studies vary tremendously in definitions of antisocial behavior and have various methodological problems (293).

Reviewers of the literature on twins and violence and adoptees and violence have come to different conclusions about the linkage of heredity and violence. Heredity has been characterized as having some role in violent delinquent behavior (331), as having no relationship with violent offending among adult men (395), and as possibly contributing to aggression in adolescence and early adult life (53).

The association of another genetic factor—variability in the number and length of the male sex chromosome—with violent behavior among adolescents requires further investigation (331,395).

Some studies have examined biochemical/hormonal linkages with delinquency, but the results are inconclusive. Some studies indicate that low serum cholesterol has some association with violent behavior in children with attention deficit disorders (331). There are conflicting results among studies of testosterone levels and adolescent violent behavior (331,381,395). Evidence linking progesterone with violent behavior during the adolescent period is indirect (331) and based on studies of flawed design (395).

Current research in many aspects of neuroscience now concentrates on neurotransmitters (substances that are released by nerve cells to carry nerve impulses to adjoining cells). Some of the several substances that have been found to be neurotransmitters are associated with inhibitory effects on brain function and others are associated with excitatory effects upon brain function. Studies suggest that either inhibitory neurotransmitters, particularly serotonin, or excitatory agents, or both, may be involved in the genesis of aggressive behavior patterns. The balance of inhibitory and excitatory neurotransmitter activity may dictate the likelihood of violent behavior under certain circumstances, and this mechanism may be the final common pathway by which other variables, such as cholesterol or testosterone levels or the presence of violence-inducing illicit substances, achieve their effects (331,395). Research has been conducted on the association of many other biological factors and delinquent behavior (329), but the results are inconclusive. Thus, no single biological variable can be specifically linked with delinquency (53), although evidence about the association of biological factors and adolescent delinquency is suggestive (53,93,329). A sufficient body of evidence has not yet developed, and it is particularly difficult to use scientific sampling, control group comparisons, and other validity checks when conducting research on the linkage of biological factors and delinquency.

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[61] Elliott has also noted that the influence of early parent training and school bonding is channeled through the type of friends chosen during early adolescence. Adolescents who are isolated from family and conventional society are more likely to turn to peer groups who often are groups who are tolerant of and even encourage delinquent behavior (i.e., gangs) (97).

[62] One of the methodological problems in conducting research on delinquency is that the populations in much of the research on the association of violence and biological factors are samples of adjudicated offenders who have been placed in clinical treatment settings. Thus, the findings of such research are hard to generalize. They may apply only to such delinquents rather than to delinquents as a whole. Or the studies may measure the association of biological traits with arrest or conviction rather than the association between biological factors and violence.

Alcohol or Illicit Drug Use Immediately Before Offending[63]—Available evidence indicates that many delinquent acts appear to be committed while, or immediately after, the perpetrator has been drinking *beverage alcohol* (without the concomitant use of any other drug). Different sources vary somewhat in their findings regarding the strength of the association between the consumption of beverage alcohol and the commission of delinquent acts.

In 1987, the Bureau of Justice Statistics within the U.S. Department of Justice conducted a self-report interview survey of 11- to 25-year-old offenders in long-term, State-operated juvenile institutions (415). This survey found that nearly 9 percent of the institutionalized offenders under age 18 reported having committed the offense for which they were institutionalized while under the influence of alcohol (415). In 1979, Elliott and researchers conducting the National Youth Survey of 14- to 20-year-olds in the general population had somewhat different findings (105). They found that alcohol alone was used immediately prior to 24 percent of aggravated assaults (including gang fights), and it was used to a lesser extent in the commission of motor vehicle thefts, larcenies, and robberies (105). Differences between these two surveys' findings may be accounted for by a number of factors: the 8-year difference in survey administration, different populations sampled, and differences in survey techniques.

Various hypotheses have been proposed to explain the association between the intake of alcohol and the subsequent commission of delinquent acts, but no one hypothesis has been confirmed. One hypothesis is that alcohol may reduce inhibitions and provoke the expression of delinquent behavior (77). Another hypothesis is that alcohol may reduce anxiety or build up the requisite courage to commit a planned offense (105).

In some cases, alcohol use before an offense may reflect typical alcohol use for the individual committing the offense. The 1987 survey of institutionalized offenders by the Bureau of Justice Statistics found that about three-fourths (76 percent) of the institutionalized offenders under age 18 had drunk alcohol at least once in the year prior to their current offense and that more than half (55.5 percent) of them had drunk alcohol one or more times a week before admission to the facility (415).

Sources of information on the association between the use of *illicit drugs* alone and the commission of delinquent acts disagree as to the importance of the association. The Bureau of Justice Statistics' 1987 survey of 11- to 25-year-old offenders in long-term, State-operated juvenile institutions found that 15.7 percent of the offenders under age 18 reported having committed the offense for which they were institutionalized while they were under the influence of illicit drugs alone (415). On the other hand, the 1979 National Youth Survey of 14- to 20-year-olds in the general population found that robbery was the only offense which was immediately preceded by drug use alone in more than 10 percent of the incidents (105). Elliott and his colleagues who conducted the National Youth Survey are careful to point out that alcohol or drug use is not necessarily the cause of any delinquent behavior.

According to the Bureau of Justice Statistics' 1987 survey of institutionalized 11- to 25-year-old offenders, it appears that more offenders are affected by using *a combination of alcohol and drugs* before they commit an offense than by only drinking alcohol or taking drugs (415). This survey found that more than 23 percent of institutionalized offenders under age 18 used both illicit drugs and alcohol immediately before they committed the offense for which they were institutionalized (415).[64]

In summary, the Bureau of Justice Statistics' 1987 survey and the 1979 National Youth Survey agree that the *use of alcohol or illegal drugs is associated with a substantial percentage of serious delinquent acts*. However, neither alcohol nor illegal drugs alone or in combination is involved in most delinquent acts, nor do adolescents use these substances only when committing offenses.

Possession of a Gun—Guns are often used while committing delinquent acts in the United States, particularly those that result in death. To OTA's knowledge, however, no research has been conducted to determine whether, and if so, to what extent, the presence of a gun increases the probabil-

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[63] For a discussion of alcohol and drug use by adolescents, see ch. 12, "Alcohol, Tobacco, and Drug Abuse: Prevention and Services," in this volume.

[64] As just noted, the percentage of institutionalized offenders who used both illegal drugs and alcohol immediately before they committed the offense for which they were incarcerated was higher than the percentage of those who used alcohol only (8.5 percent) or illegal drugs only (15.7 percent) (415).

Table 13-8—Use of a Weapon by Institutionalized Offenders Under Age 18 Who Were Sentenced for a Violent Offense, 1987[a]

	Offenders sentenced for:					
	All violent offenses	Homicide[b]	Sexual assault[c]	Robbery	Assault	Other violent offenses
Used a weapon	40.9%	77.8%	5.3%	44.0%	43.9%	28.1%
Gun	19.7	56.9	1.5	23.7	15.4	13.0
Knife	10.1	17.8	2.6	11.2	9.9	9.5
Other[d]	11.1	3.1	1.2	9.1	18.6	5.6
Did not use a weapon	59.2%	22.3%	94.7%	56.0%	56.1%	71.9%
Number of offenders	8,194	563	955	3,204	2,985	488

[a] Survey respondents were residents of long-term, State-operated juvenile facilities. Detail may not total 100 percent because of rounding.

[b] Homicide includes murder and all forms of manslaughter.

[c] Sexual assault includes rape and other sexual assaults.

[d] This category includes weapons such as axes, ice picks, scissors, clubs, baseball bats, ropes, vehicles, and objects used for strangulation or suffocation.

SOURCE: U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics, unpublished data from the "Survey of Youth in Custody, 1987," prepared by A.J. Beck, S.A. Kline, and L.A. Greenfeld, Washington, DC, 1990.

ity that a delinquent act will occur. It is clear, however, that the use of a gun worsens the outcome of a violent act that would have occurred anyway.

The Bureau of Justice Statistics' 1987 survey of 11- to 25-year-old offenders in long-term, State-operated juvenile institutions found that about 41 percent of the offenders under age 18 who were sentenced for a violent crime used a weapon in the commission of that crime (see table 13-8). The vast majority (77.8 percent) of institutionalized offenders under age 18 who were sentenced for homicide (murder or manslaughter) used a weapon, and more than half (56.9 percent) used a gun (415).

Federal law prohibits the sale of handguns and handgun ammunition to individuals under the age of 21 and the sale of rifles, shotguns, and ammunition for them to individuals under the age of 18 (Title 18 of the U.S. Code section 922, subsection 1). State laws also limit the ownership, purchase, and possession of firearms by minors. As noted elsewhere in this Report, 40 percent of 8th and 10th graders responding to the 1987 National Adolescent Student Health Survey reported having used a gun some time during the year prior to the survey; 35 percent of the respondents who had used a gun in the last year had used a gun more than 10 times (12).[65] Almost 40 percent of 10th graders (and almost half of male 10th graders) said that they could get access to a handgun, and 1.6 percent reported carrying a handgun to school during the year before the survey.[66]

Nationwide, the number of adolescents identified as murder offenders and the use of guns by adolescent murder offenders have been increasing (see table 13-9). In 1976, 1,859 10- to 18-year-olds in the United States were identified as murder offenders; 993 (53 percent) of them used guns and 866 (47 percent) used other weapons (411). In 1988, 1,926 10- to 18-year-olds were identified as murder offenders; 1,136 (59 percent) of them used guns and 790 (41 percent) used other weapons. Thus, from 1976 to 1988, the number of 10- to 18-year-olds identified as murder offenders increased by about 4 percent, and the number of murders where guns were used by 10- to 18-year-olds increased by 14 percent, although the size of the adolescent population decreased (411).

The number of adolescents who were murder victims and the number whose murder resulted from

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[65] See ch. 5, "Accidential Injuries: Prevention and Services," in this volume. The question did not distinguish between possible legal and illegal use of guns; rather the question was stated broadly ("During the past year, about how many times did you use a handgun, rifle, or shotgun for any reason [including hunting or target shooting]?") (12). Results were reported in the category of "exercise safety and high-risk sports," although the questionnaire included the question about guns in a more general list of questions about high-risk behaviors (including questions about taking medicine prescribed for someone else; driving or riding on a go-cart, snowmobile, or all-terrain vehicle; using alcohol or drugs while swimming or boating). Responses listed as pertaining to "access to weapons" were limited to carrying various types of weapons to school and the perceived availability of handguns.

[66] Fifteen percent reported carrying a knife to school, and 8 percent reported carrying another weapon (12).

Table 13-9—Use of Guns and Other Weapons by Adolescent Murder Offenders, 1976 and 1988

	Adolescent murder offenders, 1976			Adolescent murder offenders, 1988		
Offender's age	Total	Used a gun	Used another weapon	Total	Used a gun	Used another weapon
10	4	1	3	1	1	0
11	15	9	6	7	3	4
12	12	6	6	14	8	6
13	39	22	17	41	21	20
14	95	38	57	98	63	35
15	215	125	90	221	137	84
16	385	207	178	373	244	129
17	527	289	238	571	377	194
18	567	296	271	600	282	318
Total	1,859	993	866	1,926	1,136	790

SOURCE: U.S. Department of Justice, Federal Bureau of Investigation, unpublished 1976 and 1988 data from the Uniform Crime Reports, Washington, DC, December 1989.

Table 13-10—Use of Guns and Other Weapons To Kill Adolescent Murder Victims Ages 10 to 18, 1976 and 1988

	Adolescent murder victims, 1976			Adolescent murder victims, 1988		
Victim's age	Total	Killed by a gun	Killed by another weapon	Total	Killed by a gun	Killed by another weapon
10	29	14	15	27	17	10
11	18	7	11	32	12	20
12	54	27	27	38	20	18
13	47	30	17	51	29	22
14	65	40	25	78	59	19
15	101	55	46	194	102	92
16	204	150	54	237	192	45
17	296	212	84	340	276	64
18	324	222	102	435	330	105
Total	1,138	757	381	1,432	1,037	395

SOURCE: U.S. Department of Justice, Federal Bureau of Investigation, unpublished 1976 and 1988 data from the Uniform Crime Reports, Washington, DC, December 1989.

the use of guns also increased from 1976 to 1988 (411).[67] As shown in table 13-10, in 1976, there were 1,138 victims of murder from 10 to 18 years of age; 757 (67 percent) of them died from the use of a gun, and 381 (33 percent) of them died from the use of other weapons. In 1988, there were 1,432 victims of murder from 10 to 18 years of age; 1,037 (72 percent) of them died from the use of a gun, and 395 (28 percent) of them died from the use of another weapon.

The lethality of guns for adolescents in the United States is confirmed by mortality data from the National Center for Health Statistics within the U.S. Department of Health and Human Services. These data indicate that in 1987, 65 percent of the homicide deaths among U.S. adolescents 10 to 14 years of age involved the use of a gun, and 71 percent of the homicides among U.S. adolescents ages 15 to 19 involved the use of a gun (404). Furthermore, 80 percent of the homicide deaths among black males ages 15 to 19 were associated with guns (404).[68] The United States has a much higher number of gun-related homicides among adolescents than do other *industrialized* countries. Among males ages 15 to 19, in 1986, there were 1,043 gun-related homicides (out of a total of 1,432; thus, 73 percent[69]) in the United States; there were 6 (29 percent) gun-related homicides out of a total of 21 in Canada, and there were 2 (10 percent) gun-related homicides out of a total of 21 in Japan (140a).

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[67] As noted above, Uniform Crime Reports data are based on crime reports and may not reflect the universe of homicides or other crimes. In addition, there are other differences between available Uniform Crime Reports and available vital statistics data. For example, 1988 vital statistics data were not available at the time this Report was being prepared; readily available vital statistics data are for 10- to 19-year-olds rather than 10- to 18-year-olds; and vital statistics data include homicide by legal intervention. However, Uniform Crime Reports numbers are similar to (though, as would be expected, lower than) vital statistics data. National Centers for Health Statistics' mortality data indicated that in 1987, there were 2,104 homicide deaths among 10- to 19-year-olds (404), compared with 1,432 murders reported to the Uniform Crime Reports in 1988. Vital statistics data for 1987 included 16 homicides as a result of legal intervention.

The Importance of Interactions Between Age and Factors Related to Delinquency

The interaction of specific factors and delinquency depends on the developmental status of the child or adolescent (268). Preliminary research indicates that the best predictors of delinquency when a child is 6 years of age are family characteristics and that the best predictors from 9 years onward are early childhood antisocial behaviors (268). At age 10, parent criminality appears to be the best predictor of delinquency, and at age 15, grade point average becomes the best predictor (268).

Interactions between age and a number of factors related to delinquency influence not only whether delinquency occurs but also what course delinquency takes if it occurs (353). Children who exhibit problem behaviors at an early age[70] tend to be the most delinquent and aggressive at later ages—particularly children who were delinquent when unusually young and who had a broad spectrum of interpersonal and social difficulties (e.g., lack of parental supervision, low intelligence, and low socioeconomic status (353).

Interactions Among Factors Associated With Delinquency

Although the exact mechanism of interaction is not understood in most cases, the interaction among factors with respect to delinquent behavior appears to be profound. A few of the *many* examples of factors that are thought to interact are described below.

- Certain family variables that have a direct effect on family-child relations—e.g., parental rejection, the absence of parental supervision, the lack of parental involvement, poor parental disciplinary practices—appear to be fairly strongly and directly associated with delinquent behavior.[71] Other family variables—poor marital relations as expressed by family discord, family disruption, and family size—appear to be less strongly associated with adolescent delinquency and may act indirectly by interfering with the ability of parents to appropriately supervise, or be involved with, their children or adolescents (269). Homes where parents provide only weak control over their children's behavior seem to facilitate adolescents' adhering to a delinquent peer group (106,320).
- A child who has ADHD and is impulsive and hyperactive may be difficult to handle. Parents who might be capable of supervising a child of normal temperament may not have the ability to be good parents for an impulsive or hyperactive child. Low socioeconomic status, poor parental health, social isolation, marital discord, and large family size are other factors that could further aggravate the situation (269).
- Child maltreatment and delinquent behaviors may be causal in both directions and may be the result of a common etiology in nonfunctional families and among cultural practices that legitimatize family violence (150).
- Neighborhood factors (e.g, high neighborhood delinquency rates) seem to be indirectly associated with delinquency and to operate in conjunction with family factors and peer factors (353,383).

Factors Associated With Continued Official Delinquent Activity

The previous discussion for the most part has focused on factors that are correlated with or predictive of an adolescent's decision to *engage* in delinquent behavior. Many factors have also been identified that are predictive of *continued* officially recorded delinquent activity, some of which are also associated with initial involvement in delinquent behavior.

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[68] As noted in ch. 18, "Issues in the Delivery of Services to Selected Populations," in Vol. III, homicides are the leading cause of death among black males ages 15 to 19 in the United States. Firearms have been responsible for 75 to 80 percent of all black male adolescent homicides since 1968. Between 1984 and 1987 the firearm-related homicide rate increased 66 percent from 29.6 to 49.2, which accounts for 95 percent of the increase in the total homicide rate for the 1984-87 period among black males 15 to 19 years of age (40).

[69] Note that these data are from the U.S. vital statistics system, and not from the Uniform Crime Reports.

[70] Studies have examined the onset of problem behaviors in children as young as 5 to 10 years and older. The interval between onset of problem behaviors and later delinquency varies among the studies.

[71] For a discussion of the general effect of different parenting styles, see ch. 3, "Parents and Families' Influence on Adolescent Health," in this volume.

Factors that are predictive of continued official delinquent activity include the age of first court contact, inconsistent discipline in the home, expulsion or suspensions in school, diagnosis of need for special education services, referral to protective services for abuse and neglect, parental substance abuse and criminality, sibling criminality, being behind grade level in school, and alcohol or drug use (170,439).

In addition, there are system factors such as prior probation, prior out-of-home placement for abuse and neglect, prior efforts to run away from home or out-of-home placement, number of court adjudications or referrals, and number of felony adjudications or referrals. All of these factors are highly correlated with one another, and usually a set of 8 or 12 of these variables is predictive of continued official delinquent activity (170,439).

Summary: Factors Associated With Delinquency

Understanding what factors put adolescents at risk for delinquent behavior and the strength of the relationship between such factors and delinquency would be useful in the development of interventions to prevent delinquency or to treat young offenders. Various demographic factors have been identified as risk factors for delinquency, but definitive knowledge about the strength of their linkage with delinquency is lacking. It is clear that delinquency rates generally increase with the age of the adolescent, peaking from 15 to 17 years of age and then declining for most offenses. It is also known that for most offenses, urban areas experience higher delinquency rates than suburban and rural areas.

Male adolescents are more involved in almost all categories of offenses than female adolescents, and black adolescents are more involved in almost all categories of offenses than white adolescents, but the gender/delinquency and race/delinquency relationships appear stronger if one looks at arrest records than if one looks at victim survey data and self-report data. Furthermore, gender differences in arrest rates appear to be narrowing, with arrest rates for adolescent females changing at a greater rate than arrest rates for adolescent males. The strength of the race/delinquency relationship as measured by arrest rates can be questioned, because 1) low income and living in urban areas are associated with delinquency and 2) low income and living in urban areas are more typical of black adolescents than other adolescents.

The strength of the linkage between most nondemographic factors and adolescent delinquency is similarly open to interpretation. The strength of the linkage between the factors listed in table 13-7 and delinquent behavior varies not only among the factors and age of the individual but also among studies. The statistical associations of delinquency and some factors—family factors (e.g., parental rejection, lack of parental supervision, lack of parental involvement, familial criminal behavior, and poor disciplinary practices), early socially disapproved behaviors, low IQ (particularly poor verbal ability), and associating with delinquent peers during the adolescent period—is significant and well-established in a relative sense. Other factors that also seem to be associated with adolescent delinquency include child abuse and neglect, learning disabilities and problems such as ADHD, poor school performance, and drug or alcohol use.

Some neighborhood and community factors are associated with delinquent behavior only if other factors are present and, even then, may have a low association with delinquency. The role of guns in delinquency is unclear, although the use of guns by adolescents who commit homicide and their use against adolescent homicide victims has been increasing. Alcohol and drug use seem to precipitate the commission of delinquent acts, but early delinquent behavior also precedes initiation of alcohol and drug use.

In the design of prevention and treatment strategies, it is extremely important to recognize that *few, if any, risk factors for delinquency act independently. Many of the risk factors for adolescent delinquency are interrelated in ways that are still not well understood*. It is clear that no one factor by itself is correlated with or predicts delinquency very well, but rather for most adolescents, delinquency is the result of the interaction of multiple risk factors (including individual, familial, social, and situational factors), each of which incrementally increases the risk of delinquent behavior. The importance of each factor also depends on the age of the individual.

An extremely critical question is why not all of the adolescents who have been exposed to any one risk

Box 13-B—Factors That Protect Adolescents Exposed to Risk Factors for Delinquency

A striking finding of studies of risk factors associated with offending is that many adolescents who are exposed to risk factors do *not* become delinquent. A longitudinal study in England by West and Farrington found that at least half of the high-risk adolescents[1] in the study who did not become delinquent were at the age of 22 "socially impaired" in other ways—for example, they were social isolates, unemployed, abnormally nervous, withdrawn, and unhappy (443,445).[2] A few young men in this study, however, were living productive lives and were socially adjusted (443,445). The authors posited that some of the differences in individual reactions were due to differences in the seriousness or chronicity of the environmental risk factors and some to the differences in individual temperaments.

Other studies have found that a positive temperament, including positive mood and a tendency to evoke positive responses from others, high IQ, positive school and work experiences, high self-esteem, some degree of structure in the environment, and one good relationship with a parent or other adult reduce the risk of delinquency and are related to positive (nondelinquent) outcomes in children exposed to risk factors associated with offending (295,353). Additional factors identified as having protective value include advanced self-help skills, more internal locus of control, higher self-esteem, and an informal network of family and friends who are available for support in times of crisis (295). Overall, a picture emerges of the resilient child as having an easy temperament and a higher IQ, being more autonomous, having a good relationship with at least one adult, and being more successful and involved in school.[3]

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[1] High risk was defined as having a parent or sibling who had a criminal record and exposure to two other risk factors, including a family on social welfare and permanent separation from one or both parents by the age of 15 (443).

[2] This finding led Rutter and Giller to suggest that for many recidivists, delinquency may be one aspect of a broad range of personal problems (353).

[3] For further discussion of resilient children, see in ch. 18, "Issues in the Delivery of Services to Selected Groups of Adolescents," in Vol. III.

factor become offenders. What protects them from becoming delinquent? As noted in box 13-B, some evidence suggests that having a good relationship with at least one adult and having a supportive school environment are among the factors that contribute to "resiliency" among children exposed to risk factors. Further research on this topic could provide informed directions for interventions.

Consequences of Adolescent Delinquency

Any attempt to evaluate the consequences of adolescent delinquency on adolescent offenders, on victims, and on society is problematic because the dimensions of the problem of adolescent delinquency have not been established. As noted earlier, the volume and distribution of delinquent acts and the number and characteristics of adolescents involved in delinquency in any one year are not definitively known. Furthermore, data sources and studies that directly address the issue of the consequences of adolescent delinquency—e.g., exact national mortality and morbidity attributable to delinquent acts by adolescents—are not available.[72]

Clearly, though, society and individuals bear many costs as the result of adolescent delinquency, some of which may not be measurable. In addition to the economic and physical harm that delinquency causes individuals of all ages,[73] there are unmeasured, and perhaps immeasurable, costs due to adolescent delinquency, particularly violent delinquent acts. These include the cost associated with the pain, suffering, the reduced quality of life of victims and their families, and the fear of violence experienced by members of society that restrains them from pursuing their normal activities of living. Violent delinquent acts also result in a high death toll, high costs for the hospital and other care of injured persons, and the prevalence of long-term disabling conditions. The trauma centers of many hospitals, particularly in large metropolitan areas, are facing financial crises, in part, because of shootings and stabbings of individuals, many of whom are adolescents and most of whom are reported to have no insurance coverage (437).[74]

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[72] A recent analysis of the cost of injury provides some evidence on effects of homicide and other intentional injuries (340). That analysis notes that 19,830 deaths in the United States in 1985 were the result of homicides and that about 130,869 persons were hospitalized as the result of injuries intentionally inflicted by others. (The data to categorize intentional injuries other than those requiring hospitalization are not available.) The authors do not specify ages of those who committed the homicides and inflicted injuries serious enough to require hospitalization, or the ages of their victims.

Valid information on injuries sustained as a result of crime is also presented in a report on all physical injuries resulting from a rape, robbery, or assault and reported to the National Crime Survey (420). That report does not add to information on personal consequences of adolescent delinquency, since the age of the offender is not provided.

[73] The extent to which adolescents are victims of crime and delinquency is discussed below in the section entitled "Adolescents as Victims of Crime and Delinquency."

At present, there is no solid foundation upon which to base estimates of the costs of offending in adolescence. The most critical deficiency is the lack of data on the costs of offending disaggregated by age—e.g., Are burglaries committed by adolescents as costly as those committed by adults? Do aggravated assaults committed by adolescents result in more serious health impairments than those committed by adults?—and the lack of self-report data that would allow researchers to ascertain what proportion of offenses are committed by adolescents as opposed to adults. Arrest rates might provide some basis for making such estimates, but we do not know whether the likelihood of arrest varies by age—e.g., Are adolescent burglars more or less likely to get caught than adult burglars?

Only partial data are available for use in estimating the costs of offending by offenders of all ages. The Federal Bureau of Investigation in the U.S. Department of Justice provides estimates of economic losses due to robberies, burglaries, larceny/theft, motor vehicle theft, and arson in its annual Uniform Crime Reports (409). Estimates of the economic costs and the time lost from work due to robbery, rape, assault, and theft are also available from the National Crime Survey conducted by the Bureau of Justice Statistics in the U.S. Department of Justice (414). The National Crime Survey also provides estimates for medical expenses due to robbery and assault. Many costs are not in the Uniform Crime Reports or National Crime Survey estimates, however, including the costs associated with most minor offenses, the cost of premature death, the costs of private security devices and services, losses from tax revenues for illegal activities, and the cost of the criminal justice system.

Estimates of the cost of offending are highly variable. For 1980, Siegel reported Federal Bureau of Investigation estimates that the cost of organized crime was $130 billion and the cost of white collar crime $100 billion (381). Conklin reported estimates from various sources that would suggest that the Federal Bureau of Investigation figures reported by Siegel should be 50-percent lower than they were (77). The Bureau of Justice Statistics presented estimates of the total receipts of criminal activity, ranging from $27 billion (less than the estimates reported by Conklin for white collar crime alone) to $137 billion (a little higher than the Federal Bureau of Investigation estimate for organized crime reported by Siegel) (415). Even allowing for the fact that the "costs" of crime may be much greater than the "receipts" generated, the latter range of estimates for receipts of criminal activity, a range of $110 billion, is terribly large. Even if age-specific data were available, it would seem best—given these variations in estimates of the costs of crime (or the gains from crime)—to avoid using them as a basis for estimating the costs of offending in adolescence.

Annual operating expenditures on juvenile confinement in public and private juvenile facilities alone exceeds $2 billion per year (418). State spending on juvenile services varies greatly: Southern States spend the least per incarcerated adolescent and Northeastern States the most (414).

Some juvenile corrections agencies receive partial financial assistance through Federal and State educational, vocational, and welfare funding.[75] A recent California legislative analysis reported, for example, that over $150 million annually in Aid to Families With Dependent Children funds is spent on group homes and foster placements for juvenile court clients (246).

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[74] As noted in chs. 5 and 6 in this volume, hospital discharge data are not coded by cause of injury, and emergency department and facility data are not available on a systematic basis; thus, it would be difficult to determine systematically the amount of care for intentional injuries afforded to adolescents without health insurance coverage. Demographic data that adolescent victims and perpetrators of violent crime are also those less likely to be insured (see chs. 16 and 18 in Vol. III) suggest that anecdotal evidence from hospital emergency departments, such as that reported by the *Washington Post*, is accurate (437).

[75] See ch. 19, "The Role of Federal Agencies in Adolescent Health," in Vol. III for a discussion of various Federal programs related to adolescent health.

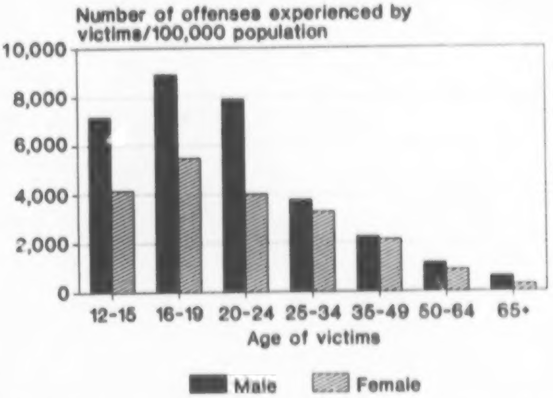
Adolescents as Victims of Crime and Delinquency

In 1988, as shown in figure 13-6, adolescents and young adults ages 12 though 24 experienced the highest victimization rates of all age groups for the violent offenses of robbery, rape, and assault committed by persons of all ages. Indeed, adolescents ages 16 to 19 have the highest rate of being victims of violence (423). Young males are far more often the victims of violent acts than females in the same age groups (423).

As shown in figure 13-7, adolescent and young adults ages 12 through 24 also experience the highest victimization rates of all age groups for theft in 1988. Whereas the victims of violence were most often young males, the victims of theft were often just as likely, if not more likely, to be young females.

Young blacks are overrepresented among the victims of most offenses committed by people of all ages. Blacks of all ages are also more likely to be the victims of all violent crimes, particularly homicide, than are whites or members of other minority groups (415). Mortality data indicate that black male adolescents ages 10 to 19 are more likely to die from homicide than are white males in the same age group (404). In 1985, 689 black males from 10 to 19 years of age died from homicide, as compared with 657 white males in this age group. The higher number of deaths among blacks is startling in light of the fact that there were almost 5.5 times as many white males as black males ages 10 to 19 in 1985 (402). The leading cause of death among black adolescents ages 15 to 19 in 1987 was homicide, while the leading cause of death among white adolescents ages 15 to 19 in 1987 was motor vehicle injuries (see figure 13-8 and figure 13-9). Although homicide is not the leading cause of mortality for either white or black 10- to 14-year-olds, black 10- to 14-year-olds are still disproportionately affected by homicide.

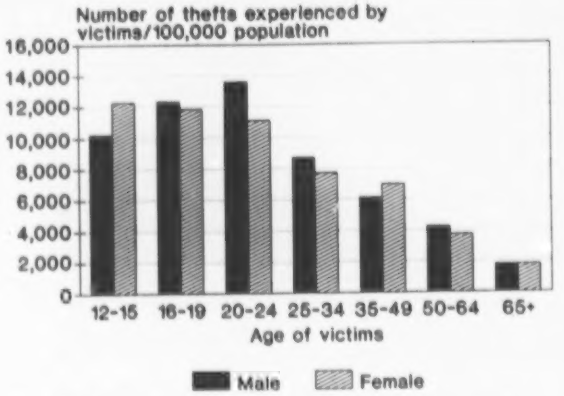
Figure 13-6—Victimization Rates[a] for Rape, Robbery, and Assault by Age and Sex, 1988



[a] The *victimization rate* is the number of offenses experienced by a given population per some population base during a given time period.

SOURCE: U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics, *Criminal Victimization in the United States, 1988* (Washington, DC: forthcoming).

Figure 13-7—Victimization Rates[a] for Theft by Age and Sex, 1988



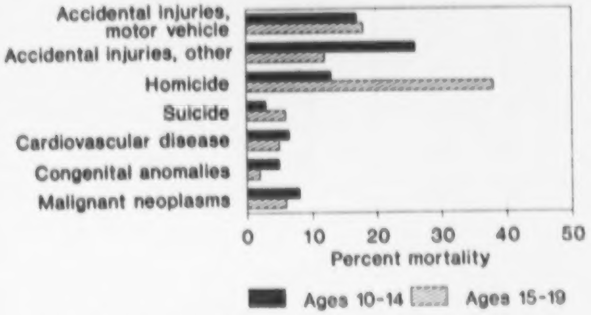
[a] The *victimization rate* is the number of offenses experienced by a given population per some population base during a given time period.

SOURCE: U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics, *Criminal Victimization in the United States, 1988* (Washington, DC: forthcoming).

Young blacks from 12 to 19 years of age are also considerably more likely to be victims of robbery, rape, and assault committed by people of all ages than are young whites ages 12 to 19 (see figure 13-10). In the case of theft, the pattern is somewhat different. Black adolescents ages 12 to 15 are somewhat more likely to be victims of theft than white adolescents of those ages, but blacks ages 16 to 19 are much less likely to be victims of theft than white adolescents of those ages (see figure 13-11).

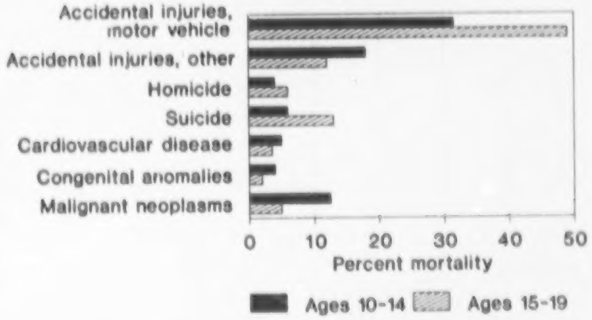
As in the case of delinquency, it is hard to disentangle the factors of race, location, and poverty in analyses of victimization. Adolescents who live in inner cities experience higher victimization rates than those who live in the suburbs (446), and a large proportion of black and Hispanic adolescents live in inner cities (157).

Figure 13-8—Percent Mortality Due to Seven Leading Causes of Death for Black Adolescents Ages 10 to 14 and 15 to 19, 1987



SOURCE: National Center for Education in Maternal and Child Health, *The Health of America's Youth* (Washington, DC: September 1990).

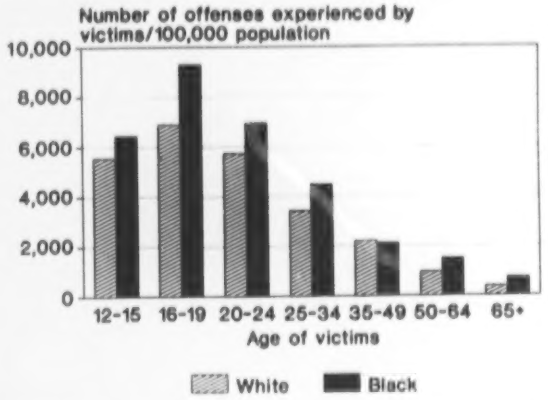
Figure 13-9—Percent Mortality Due to Seven Leading Causes of Death for White Adolescents Ages 10 to 14 and 15 to 19, 1987



SOURCE: National Center for Education in Maternal and Child Health, *The Health of America's Youth* (Washington, DC: September 1990).

It is clear, however, that adolescents themselves pose a risk to adolescents. Individuals ages 12 to 19 are by far the major victims of the violent offenses of robbery, rape, and assault committed by individuals ages 12 to 20.[76] In 1987, more than 60 percent of the 1,711,840 reported violent offenses of robbery, rape, and assault committed against victims 12 to 19 years of age were committed by offenders ages 12 to 20 (419).[77]

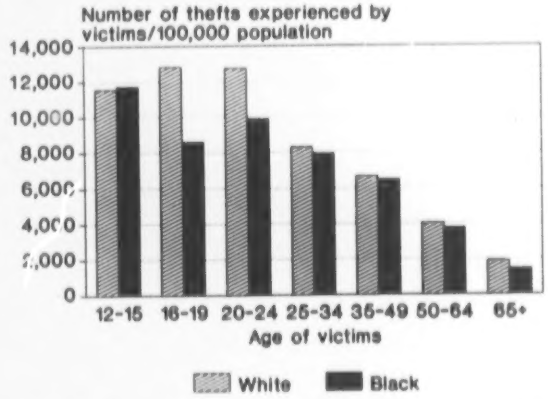
Figure 13-10—Victimization Rates[a] for Rape, Robbery, and Assault by Age and Race, 1988



[a]The *victimization rate* is the number of offenses experienced by a given population per some population base during a given time period.

SOURCE: U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics, *Criminal Victimization in the United States, 1988* (Washington, DC: forthcoming).

Figure 13-11—Victimization Rates[a] for Theft by Age and Race, 1988



[a]The *victimization rate* of victims is the number of offenses experienced by a given population per some population base during a given time period.

SOURCE: Office of Justice Programs, Bureau of Justice Statistics, *Criminal Victimization in the United States, 1988* (Washington, DC: forthcoming).

Another category of victim is the adolescent who views delinquent behavior, particularly violent acts. Preliminary research indicates that significant numbers of children and adolescents have seen violent acts, such as shootings and stabbings (38,158). The early findings also indicate that viewing violence is deleterious to the normal emotional and intellectual development of children exposed to violence (38).

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[76] The focus of this OTA Report is on 10- through 18-year-olds. Some of the data presented in this discussion are for other age groupings because data for 10- through 18-year-olds are not readily available.

[77] National data relating both the age and race of offenders to the age and race of their victims are not available. Thus, while it is known that the great majority of violent offenses against whites are committed by whites (79 percent of robberies, rapes, and assaults, and 88 percent of murders) and that the great majority of violent offenses against blacks are committed by blacks (82 percent of robberies, rapes, and assaults, and 94 percent of murders), the ages of victims relative to the victimizers within races are not known (408,419).

Prevention of Adolescent Delinquency[78]

When considering approaches to preventing delinquency among adolescents, it is important to note methodological and other problems in the literature evaluating past prevention efforts. One is the problem of different definitions of delinquency, noted in the first section of this chapter. The definition of delinquency is critical when designing, implementing, evaluating, and comparing prevention programs.

Another critical issue is the paucity of evaluations of many interventions to prevent delinquency, particularly of programs developed and implemented by schools and communities in response to pressing social problems. Programs developed by university-based researchers have generally been more rigorously evaluated (455). However, a general problem is that the evaluations that are conducted are typically performed by the same organizations and individuals who design and implement the interventions.

A major problem in all methods used to evaluate prevention and treatment interventions is that the researchers in delinquency have typically but incorrectly assumed that programs that fall under the same general rubric (e.g., group homes) are all providing the same type of service to a uniform degree to the adolescents involved. As a result, only outcomes are evaluated, although processes that affect the implementation or strength of an intervention may have a greater influence on the program's effectiveness than the program's overall intervention strategy per se (177,362). Systematic documentation or investigation of outcome and process factors in evaluation reports is rare, which makes it impossible to tell whether a strategy failed because it was implemented badly, its impact was limited by mediating processes, or the underlying theoretical assumptions were wrong.

Another issue of importance is that although information gleaned from the knowledge of factors linked to delinquency has potential for designing preventive strategies, many programs do not make use of such information. In devising prevention strategies, it would be useful to incorporate knowledge about the relationship of particular factors, and knowledge of the development of delinquent behavior Interventions should not be expected to be equally effective across all stages of child and adolescent development. As an obvious example, family approaches might be expected to have better outcomes with younger adolescents than with older adolescents.

Strategies for the primary and secondary prevention of adolescent delinquency are discussed below. Table 13-11 displays several types of primary and secondary prevention interventions.

Primary Prevention of Delinquency

Primary prevention of adolescent delinquency means identifying individuals at risk for delinquent behavior because of their general life situations (e.g., children in stressed families) or identifying environments at risk for delinquent activity (e.g., school settings) before the delinquent behavior has occurred, and intervening to reduce the eventual amount of delinquent behavior in that group or setting.[79]

Family-Based Primary Prevention[80]

Provision of Family Support Services—The provision of family support services refers to the provision to families of a broad array of social support services, including day care, medical care, counseling, family needs assessment, and referrals to other social service agencies. Although numerous studies have examined the effects of family support on infants and disadvantaged families (40,71,72,278, 318,330), only a few have examined the long-term effects of day care and other family support interventions on later delinquency and antisocial behavior.

A notable exception is the Yale Child Welfare Research Program (364,365), an intervention that provided to low-income mothers and their first-born

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[78] This section is based on a paper entitled "Review of Programs for the Prevention and Treatment of Delinquency," prepared for OTA under contract by Edward Mulvey, Michael A. Arthur, and N. Dickon Reppucci (295).

[79] In many health areas, primary prevention is not limited to high-risk individuals.

[80] Since, as noted earlier, poor family functioning is strongly related to delinquency, intervention with families has received wide endorsement as a locus for preventive intervention (29,55,186,267,269,389).

Table 13-11—Illustrative Primary and Secondary Preventive Interventions for Delinquency

Primary prevention
Family-based
- Family support
- Parent skill training

School-based
- Preschool programs
- Cognitive-behavioral programs
- Social process interventions

Community-based
- Community watch organizations
- Adolescent support organizations
- Youth recreation

Secondary prevention
- Vocational and alternative education programs
- Family therapy and family communication skills training

SOURCE: Office of Technology Assessment, 1991.

children a coordinated set of social work, pediatric, child care, and psychological services for 30 months following the child's birth. Ten years following the end of intervention, when they were 12.5 years of age, boys whose families were involved in the program were found less likely to exhibit predelinquent behavior problems, such as truancy, than comparison boys whose families were not involved (364,365). These long-term results may not be generalizable because they were based on comparisons of only 15 matched experimental and control low-income families, none of whom were suffering from serious health or emotional problems.

The Yale Child Welfare Program cited evidence for approximately $40,000 in benefits per year after a total program cost per child of $20,000 (364). The analysis on which these figures were based, however, was not comprehensive enough to represent a complete picture of the cost-benefit ratio (30).

Parent Skill Training—Parent skill training involves teaching child development and parenting skills to parents. Documentation that this is an effective primary preventive strategy for delinquency is limited. The only evidence comes from a small number of reports which found that the siblings of delinquent youths whose parents received parent skill training were less likely to exhibit problem behaviors (20) and delinquency (244) than were siblings of delinquent youth whose parents did not receive such services. These data suggest, however, that parent training may be effective for adolescents at high risk of delinquency.

Some studies have assessed parent training as a component of larger prevention packages. An intervention with low-income Mexican Americans with children ages 1 to 3 (227) and a carefully assessed delinquency prevention project based in eight, inner-city Seattle schools (186) were found to have positive attitudinal and behavioral outcomes for the parents and children. The Seattle project also reported that children in the experimental classes were less likely than children who were not in such classes to have started drug use or delinquent activity by the fifth grade (185). In neither of these programs, however, can the effects of parent training be separated from other aspects of the intervention.

A consistent finding is that high-risk parents, i.e., those subject to multiple stresses, often do not complete a family training program or a program with a family training component (89,90,227,435).

School-Based Primary Prevention

Preschool Programs[81]—Head Start is the Federal Government's comprehensive child-development program designed to enhance the social competence of low-income 3- to 5-year-olds. Along with educational instruction, the program delivers health and dental care, immunizations, and hot meals to its preschoolers while connecting children's families with needed social services to help them achieve self-sufficiency.

On balance, followup evaluations of Head Start programs indicate that many of the programs produce short-lived improvements in children's IQ and academic performance and long-term improvements in school functioning, including a reduced need for special education placement and an increased likelihood of grade promotion and graduation (183,465). Because there is an association of factors that affect school functioning with delinquent behavior, many Head Start programs can be said to have an indirect preventive effect on delinquency.

Followup evaluations on the effects of Head Start in *directly* preventing delinquency, however, are sparse. One exception, a longitudinal evaluation of the Perry Preschool Project, found evidence of reductions in delinquency, adolescent pregnancy, and crime (43,44,361). Fifty-eight 3- to 4-year-olds who were participants in the Perry Preschool Project were followed up through age 19, as were matched controls. In comparison to the control group, program participants at age 19 were less likely to have been arrested at all, to have had five or more arrests, to have had special education placements in school, to have dropped out of high school, or to have been on welfare. Participants also had lower rates of adolescent pregnancy and adult arrests and higher rates of adult employment and postsecondary school enrollment (43,44,361). The program appeared to have a greater effect on adult arrests than on juvenile arrests.

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[81] As noted in the section on factors associated with delinquency, a large body of research has shown that low IQ, learning disability, and school failure are related to and often precede official and self-reports of delinquent behavior. School-system-level interventions intended to prevent delinquent behavior have only recently been tried (126,286), bolstered by research showing that school processes and climate are related to academic achievement and rates of delinquent behavior by students (137,352). For a general discussion of how schools affect adolescents, see ch. 4, ''Schools and Discretionary Time,'' in this volume.

The evaluation of the Perry Preschool Project reported that the program resulted in benefits to taxpayers of approximately $28,000 per child participant, about six times the annual program operation cost of about $5,000 per child (361). The analysis included a broad range of calculated benefits and costs and discounting for the time difference between costs and long-term benefits (30,43).

Cognitive-Behavioral Skills Training Programs—Cognitive-behavioral interventions are based on the idea that delinquency sometimes results from an inability to develop and maintain positive social relationships due to deficits in social skills (59,288, 391).[82]

Evaluations of cognitive-behavioral skills training programs have shown that such programs yield consistent, short-term improvements in problem-solving abilities (e.g., 92,175,379,380,441), particularly for younger, disadvantaged children. Evaluations of such programs also provide evidence that such programs produce behavioral improvements (37,349,379,380), but the evidence for long-term behavioral improvements is not clear (92,175,288). Cognitive-behavioral skills training has also been used as a secondary preventive intervention with children who have conduct disorders, and investigators have found that changes in behavior at home, at school, and in the community are evident up to a year later (235).

An interesting approach that incorporates many of the techniques used in cognitive-behavioral strategies has been mounted in Massachusetts, the aim being to change adolescents' attitudes toward the use of violence (323). Using a standard curriculum of information provision and role-playing, the Violence Prevention Curriculum Project specifically addresses the issue of anger and the control of violence. This program is attractive for its focus and direction, but interpreting the only evaluation of its overall effectiveness is somewhat problematic because the curriculum was published and evaluated by the same organization (455). The evaluation found that the curriculum had a statistically significant impact on students' knowledge and locus of control.[83] Marginal, but not statistically significant, differences were found for positive self-esteem and for self-reports of arrest. The final report emphasizes the problems of implementing the rigorous study design and concludes that the findings should be viewed as preliminary.[84]

Social Process Interventions—The major focus of school-based social process interventions is to change the social structures and processes of schools to encourage greater involvement and commitment among students (54,61,133,168,188). Some of the interventions also incorporate social skills training.

Evaluations of a project that trained seventh grade teachers in inner-city schools to apply proactive classroom management, interactive teaching, and cooperative learning strategies reported generally positive results regarding teacher behavior and the relationship of the adolescents to the school environment after 1 year (187,189). Students in experimental classes had fewer disciplinary actions and days suspended and reported less frequent drug use at school than students in control classes but did not differ in self-reported school delinquency (187,189).

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[82] *Interpersonal cognitive problem-solving* (ICPS) programs focus on processes such as interpreting social cues and others' intentions, generating alternative solutions to social problem situations, evaluating the likely outcomes of different solutions, and means-ends thinking (379). *Behavioral social skills training* (BSST) interventions focus on teaching specific behaviors such as entering a peer group, accepting criticism, giving compliments, and resisting peer pressure (288). Many programs incorporate aspects of both ICPS and BSST (37,59,288). These are generally presented as a part of a school curriculum and done in small groups of students.

[83] Twenty-five constructs were measured in a survey, including frustration, tolerance, self-esteem, impulse control, locus of control, self-reported behaviors, fighting, life stress, peer attitudes, school climate, family conflict style, knowledge and attitudes about violence and its consequences, and sociodemographics. Locus of control describes individuals' sense of control over their environment. People with an internal locus of control believe they are the predominal source of desirable outcomes; those with an external locus of control believe that others, or chance events, determine the occurrence of desirable outcomes.

[84] During development of the school-based curriculum, the developers decided that a school-based intervention alone was insufficient, and a community-based component was developed to reinforce nonviolent options learned in the classroom. Thus, the Violence Prevention Program, a Health Promotion Program for Urban Youth, was initiated in 1986 by the Boston Department of Health and Hospitals. Community educators are using as many community settings as possible to deliver the ''violence prevention'' message. An outside evaluation team is now analyzing outcome data from this intervention (455).

Although many studies have reported that changes in teacher and classroom procedures have positive results on classroom behavior (52,54,61,133,134,168, 188,442), very few studies (e.g., 48a) have demonstrated that such interventions can have a positive effect on subsequent achievement and delinquency.

Community-Based Primary Prevention

Community organization interventions to prevent delinquency are based on Shaw and McKay's pioneering work that showed that community disorganization is related to higher rates of offending (371). As noted earlier in the section on factors associated with offending, the relation appears to be indirect (116,383). As noted below, there is a paucity of evidence on the effectiveness of all types of community-based preventive interventions, a situation which is probably due to the primitive state of measurement connected with assessing variables at a community level, and the difficulty of teasing out the many interactions among community, family, and individual level factors.

Community Watch Organizations—Neighborhood and Block Watch organizations and citizen patrols such as the Guardian Angels are attempts to decrease offending through community involvement (42,151,317,348). While such programs reduce crime and fear of crime (42,317), they are hard to organize and have been found to be less effective in high-crime neighborhoods (290,348,384,385). Evidence on the effectiveness of these programs in terms of reducing delinquency is sparse. A recent evaluation of neighborhood watch programs in inner city areas concluded that such programs, by themselves, rarely reduce delinquency and crime in inner cities areas (290). They appear, however, to help support a broader strategy that includes reducing school dropout rates, providing job training, and providing job opportunities in inner city neighborhoods (290).

Adolescent Support Organizations—Adolescent support programs provide multiple services, attempting to be responsive to the particular life situation of the individuals who come to them for help.[85] Evaluations of such targeted community-based programs offering a supportive place for adolescents to go with a variety of problems—e.g., Argus Community in the South Bronx, Delancy Street in San Francisco, or House of Umoja in West Philadelphia—are sparse and not methodologically rigorous (290). Informal assessments (i.e., assessments without formal control groups) of high-risk adolescents in the Argus Community, the House of Umoja, and the Dorchester Youth Collaborative suggest that enrollees in these programs have been less likely to commit delinquent acts than similar high-risk adolescents in the general community (290).

Youth Recreation—Numerous youth recreation programs such as the Police Athletic League, Boys' Clubs, and the Fresh Air Fund provide constructive activities for youth and theoretically reduce their involvement in antisocial activity (45). Although organized sports may have tremendous potential for promoting competence and preventing delinquency (56,81,337), this potential has never been systematically assessed. A few studies have shown a relationship between participation in organized athletic programs and lower levels of delinquent activity, particularly for working class boys (356,363).

Secondary Prevention of Delinquency

Secondary prevention of adolescents for delinquency means attempting to keep adolescents who have already shown indications of troublesome behavior (e.g., school problems) from engaging in delinquent acts such as theft or assault. (The distinction between secondary prevention programs and treatment programs may at times be arbitrary because the populations enrolled in some programs are sometimes heterogeneous. In any one program, some participants may only have indications of troublesome behavior, while others may have committed delinquent acts. Some programs that target adolescents with self-reported delinquency and official delinquency—for example, some diversion programs—are discussed in the section on treatment programs below.)

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[85] These programs can also be considered secondary prevention interventions, because some of the attendees are adolescents at high risk of delinquency (e.g., adolescents who have school problems or adolescents who have committed one or more delinquent acts).

Vocational and Alternative Education Programs[86]

Hope for vocational training and other alternatives to traditional school programs is based on the consistent finding that adolescents with behavior problems are frequently doing poorly in school, are not engaged by common classroom procedures, and are lacking in job-related skills (172,382). Evidence from a number of evaluations shows that when vocational education programs carefully integrate classroom and work experience, are perceived by students as being relevant to their interests, and are closely monitored, the programs reduce school dropout rates and increase learning and school attendance among adolescents at high risk of delinquency (168).

For the most part, the direct effect of the vocational and alternative education programs on delinquency has not been evaluated.[87] Exceptions include a series of rigorous followup studies of male adolescents who had just been expelled or dropped out of high school and then received a comprehensive intervention that combined job placement, remedial education, and psychotherapy. All aspects of the intervention were administered by one therapist. Services, which began 24 hours after the males left school, were individualized, intensive, and flexible as to time, place, and activity (277,375,376, 377,378). Data from these followup studies showed that recipients of this vocational and psychotherapeutic intervention had adjusted well in terms of employment, schooling, and marital status, and that delinquency was clearly lower among these adolescents than among adolescents in a control group. Even after 15 years, the males who had received the treatment showed much better social adaptation with respect to family life, employment success, and avoidance of legal difficulties than those in the control group. The generalizability of the studies is limited, however, because the researchers compared only 10 participants with 10 control adolescents and used a very talented therapist. Nonetheless, this study is unique in illustrating that long-term effects are possible and suggesting the importance of multiple components of treatment.

Family Therapy and Family Communication Skills Training

Family therapy and family communication skills training has been found to be effective in reducing problem behaviors among conduct-disordered children of treated families (2,32,144,235,236,314). The effects are maintained up to 1 year and occasionally longer, and programs have been found to be effective among children with conduct problems varying in severity of dysfunction (235).

Family therapy and family communication skills training does have several limitations. One is that it is not effective for some types of children and parents—e.g., parents who are dysfunctional or parents who have reached the limits in coping with a child with a conduct disorder (235). Furthermore, the method has yet to demonstrate either a long-lasting effect on delinquent behavior or success with severely antisocial adolescents.

Summary: The Effectiveness of Adolescent Delinquency Prevention Efforts

Although efforts at *primary prevention* of delinquency are relatively new, recent research has provided some evidence that *primary prevention programs at an early age may have an enduring effect in terms of reducing delinquent behavior in early adolescence.* For any given approach, the evidence on effectiveness is inconclusive and at times indirect, but the cumulative evidence from a variety of approaches—parent training programs, family support interventions, and school-based interventions—is encouraging. There are, however, too few controlled trials to draw definitive conclusions. Given what we know about the complex, socially embedded nature of delinquency and the realities of service provision, it is unreasonable to expect that any single preventive approach would be uniformly applicable and efficacious.

The overall record of strategies for efforts at secondary prevention of delinquency is less impressive. One intensive and flexible vocationally oriented program that included psychotherapy, remedial education, and job placement clearly reduced

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[86] For a discussion of schools and adolescent health, see ch. 4, "Schools and Discretionary Time," in this volume.

[87] For example, other alternative programs such as City Lights in Washington, DC (397a) and the Phoenix Program in Akron, Ohio (290) appear to be successful in involving failing students with behavior problems, but have not been evaluated in academic and vocational training programs, correcting their educational problems, or reducing behavioral problems. Preliminary evaluations indicate success in increasing the school attendance rate of failing students and the Phoenix Program has shown a decline in recidivism rates (290).

Photo credit: Education Week

Adolescents who do well seem to have strong and developmentally appropriate social support, preferably from their families, but if not from their families, from some other adult or adults.

delinquency in the long term (375,377). The quality of the findings suggests that such programs may be a promising way to prevent delinquent behavior, but the program that was evaluated had a very small sample size, which hinders application of findings to other populations. Promising early evidence suggest that organizations providing multiple elements—e.g., advocacy, mentoring, nutrition, social support, employment training, and/or employment placement to high-risk adolescents—result in multiple advantages to high-risk youth. These advantages include less involvement with delinquency than similar high-risk adolescents (290). However, more scientifically rigorous evidence is needed for definitive conclusions about the effectiveness of these interventions in preventing adolescent delinquency.

Following their review of prevention programs on behalf of OTA, Mulvey and his colleagues concluded that three general lessons can be drawn (290). One lesson is that policymakers at all levels should seriously plan for service provision as an ongoing, rather than "one shot," enterprise. For adolescents who appear to have an identifiable propensity for antisocial behavior, interventions should be conceptualized as a series of possible treatments for a problem that is likely to appear again in a different form as the adolescent becomes older and new issues and challenges arise.

A second major lesson would seem to be that successful prevention programs appear to take a broadly based approach, addressing behavior in its social context. Because delinquency is not unidimensional or independent of a variety of social forces, interventions must address multiple issues of the youth's family, school, and peer life to show any real progress. There is little evidence that any service, regardless of its modality or theoretical rationale, can produce impressive results when applied in isolation. Early intervention programs that provide comprehensive care to families, cognitive behavioral curriculums that are coupled with changes in the school environment, and individual interventions that work with the adolescents' home, school, and peer environment appear to provide more impressive results than programs that are focused on a single facet of an adolescent's life.

The third clear lesson is that preventive services (e.g., family support services) are not delivered uniformly and that it is counterproductive to continue to evaluate them as if this were true. Comparing services only according to their avowed theoretical approach or stated program type appears to be a task with limited return. Better measures of particular program dimensions independent of theoretical justification or basic program type (such as intensity or comprehensiveness of service delivery) as well as operational measures of program operation are clearly needed.

Services and Interventions for Adolescents in the Juvenile Justice System[88]

The source of almost all services and interventions explicitly aimed at reducing adolescent delinquency once it has been officially detected is the juvenile justice system, which includes law enforce-

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[88] This discussion is based partially on a paper entitled "Review of Programs for the Prevention and Treatment of Delinquency," which was prepared under contract for OTA by Edward Mulvey, Michael A. Arthur, and N. Dickon Repucci (290), and on a paper entitled "Juvenile Justice: A Critical Examination" prepared by B. Krisberg under contract to the Carnegie Corporation of New York and the Carnegie Council on Adolescent Development in support of the OTA study on adolescent health (246).

Table 13-12—Age at Which Criminal Courts in Different States Gain Jurisdiction of Young Offenders

Age of offender when under criminal court jurisdiction	States
16 years	Connecticut, New York, North Carolina
17 years	Georgia, Illinois, Louisiana, Massachusetts, Missouri, South Carolina, Texas
18 years	Alabama, Alaska, Arizona, Arkansas, California, Colorado, Delaware, District of Columbia, Florida, Hawaii, Idaho, Indiana, Iowa, Kansas, Kentucky, Maine, Maryland, Michigan, Minnesota, Mississippi, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Dakota, Tennessee, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, Federal districts
19 years	Wyoming

SOURCE: L.A. Szymanski, "Upper Age of Juvenile Court Jurisdiction Statutes Analysis," National Center for Juvenile Justice, Pittsburgh, PA, March 1987.

Table 13-13—Reasons for Referral of Delinquency Cases to Juvenile Courts, 1987

Reasons for referral	Number of cases	Percentage
Serious violent offense[a]	64,000	5.6%
Murder and nonnegligent manslaughter	1,500	0.1
Forcible rape	4,000	0.3
Robbery	21,500	1.9
Aggravated assault	37,400	3.3
Serious property offense[a]	498,000	43.5
Burglary	131,700	11.5
Larceny-theft	311,600	27.2
Motor vehicle theft	48,600	4.2
Arson	6,100	0.5
Minor delinquent offense[b]	583,000	50.9
Simple assault	99,700	8.7
Stolen property offenses	27,900	2.4
Trespassing	50,200	4.4
Vandalism	84,300	7.4
Weapons offenses	20,000	1.7
Other sex offenses	18,200	1.6
Drug law violations	73,700	6.4
Obstruction of justice	80,900	7.1
Liquor law violations	16,300	1.4
Disorderly conduct	47,800	4.2
Other delinquent acts	63,700	5.6
Total delinquency	1,145,000	100.0

NOTE: Detail may not add to total because of rounding.

[a] *Serious offenses* are Federal Bureau of Investigation Part I offenses (i.e., murder and nonnegligent manslaughter, forcible rape, robbery, aggravated assault, burglary, larceny/theft, motor vehicle theft, and arson). Individual Part I offenses may not be considered serious by other definitions, however.

[b] *Minor offenses* are Federal Bureau of Investigation Part II offenses. Individual Part II offenses may not be considered minor by other definitions, however.

SOURCE: H.N. Snyder, T.A. Finnegan, E.H. Nimich, et al., prepublication draft of "Juvenile Court Statistics, 1987," National Center for Juvenile Justice, Pittsburgh, PA, 1990.

ment officers and others who refer delinquent and maltreated juveniles to the courts, juvenile courts which apply sanctions for delinquent offenses and oversee the execution of child protective services, juvenile detention and correctional facilities, and agencies that provide protective services and care (e.g., foster care) for juvenile victims of abuse and neglect. The discussion that follows focuses primarily on the handling of adolescents by juvenile courts and juvenile detention and correctional facilities.

What Is the Juvenile Justice System?

The juvenile justice system is actually 50 distinct statewide juvenile justice systems. State statutes that establish the legal authority for the delivery of juvenile justice services vary widely from State to State. The upper age of juvenile court jurisdiction differs from State to State (see table 13-12), as does the scope of misconduct leading to juvenile court intervention (see table 13-13). Washington State, for example, excludes status offenses from court authority, whereas States such as California merely limit the range of sanctions to be used with status offenders (246). Some States have full-time juvenile court judges, whereas others rotate judges in and out of juvenile court assignments. Juvenile court judges vary dramatically in their legislatively mandated powers and the extent of their judicial training and experience (351).

The manner in which most juvenile courts process delinquency cases is illustrated in figure 13-12 in simplified form (388). Police are the primary source of referrals to the juvenile court,[89] but school authorities, social welfare agencies,[90] and parents

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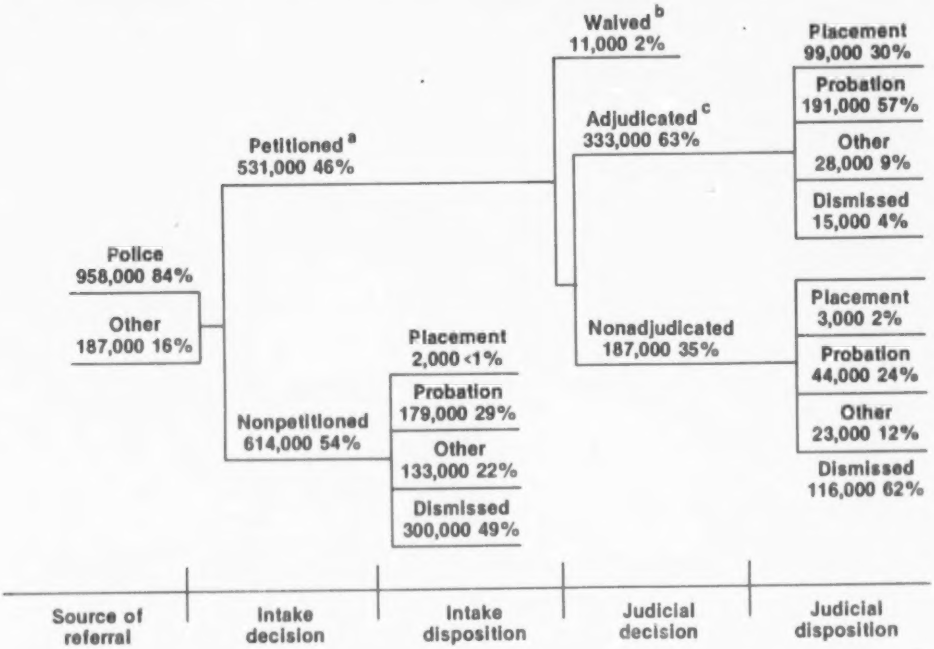
[89] The police make the initial decision about adolescents whom they have recognized as committing offenses. In some locales virtually all, and in others only half, the young people stopped by the police are arrested (453,458). Police may informally warn and verbally reprimand adolescents who they do not arrest, or they may refer them to nonjudicial agencies (e.g., youth service bureaus and community-based organizations) or to their guardians.

[90] In some cases, an adolescent is a delinquent, an abused child, a youth in need of special education services, *and* a welfare recipient. Such adolescents may be referred to juvenile courts, despite other needs that may be more pressing. Social service agencies may adopt selection criteria that exclude clients, particularly older adolescents with histories of mental illness and aggressive behavior. However, public correctional agencies cannot refuse to take custody of adolescents lawfully committed to their care.

Figure 13-12—Juvenile Court Processing of Delinquency Cases, 1987


Waived[b]
11,000 2%
Placement
99,000 30%
Probation
191,000 57%
Adjudicated[c]
333,000 63%
Petitioned[a]
531,000 46%
Other
28,000 9%
Dismissed
15,000 4%
Police
958,000 84%
Other
187,000 16%
Placement
3,000 2%
Placement
2,000 <1%
Nonadjudicated
187,000 35%
Probation
44,000 24%
Probation
179,000 29%
Nonpetitioned
614,000 54%
Other
23,000 12%
Other
133,000 22%
Dismissed
116,000 62%
Dismissed
300,000 49%
Source of referral
Intake decision
Intake disposition
Judicial decision
Judicial disposition

[a] A petition is filing a document in juvenile court alleging that a juvenile is a delinquent, a status offender, or dependent. A petition requests that the court assume jurisdiction over the juvenile or that the juvenile be transferred to criminal court for prosecution as an adult.

[b] A waived case is one that is transferred to the criminal court.

[c] An adjudicated case is one in which the court has entered a judgment.

SOURCE: H.N. Snyder, T.A. Finnegan, E.H. Himick, et al., prepublication draft of "Juvenile Court Statistics, 1987," National Center for Juvenile Justice, Pittsburgh, PA, 1990.

also refer cases.[91] Between referral and court intake, some delinquency cases (20 percent in 1987) are held in detention facilities (388). At court intake, an intake officer makes a decision about whether or not to file a delinquency petition (i.e., to process the case formally by the courts). About half the cases (54 percent in 1987) are handled informally at the intake level and the adolescent is dismissed, referred to social service agencies, placed on probation, or placed in secure confinement (388). Intake officers also recommend to judges whether adolescents should be detained pending their case being heard by a judge.

At the next stage, judges or their designated assistants (referees) decide on the legal merits of the delinquency petition. Of formally petitioned cases, 35 percent are either dismissed or handled without a juvenile court adjudication hearing and 63 percent have a juvenile court adjudication hearing. As figure 13-12 shows, the possible dispositions of adjudicated or nonadjudicated cases are similar to nonpetitioned cases, except that a small number of nonadjudicated cases, generally cases involving the most serious offenses, receive special hearings and are transferred or waived to the criminal court system.

The juvenile courts tend to use informal, diversionary case dispositions. In 1987, only 30 percent of the delinquency cases referred to the courts resulted in formal adjudication and only 9 percent ended with a placement in a private or public residential facility.

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[91] The data in this and the succeeding section are mainly from a nonprobability sample of 1,133 courts with jurisdiction over roughly 49 percent of the Nation's at-risk youth population—the National Juvenile Court Data Archives (388). The National Juvenile Court Data Archives uses a complex weighting procedure to generate national estimates based on data from the reporting jurisdictions. Because the data are not based on a probability sample, the sampling error or confidence intervals around the statistics presented are unknown.

Who Are the Adolescents in the Juvenile Justice System?

Adolescents Referred to the Juvenile Courts

Adolescents may be referred to the juvenile courts for delinquent offenses or because they are victims of neglect or abuse (418).[92] Those referred for delinquent offenses are usually referred by the police. Not surprisingly, therefore, the numbers and types of delinquency offenses for which juveniles are arrested are similar to the numbers and types of offenses for which adolescents are referred to the juvenile courts.[93] In 1987, for example, serious violent offenses made up only a small fraction of delinquency offenses for which juveniles were arrested or referred to the court; serious property offenses made up a larger fraction; and minor offenses made up the largest fraction (see table 13-13).[94]

Juveniles referred to juvenile courts for delinquent behavior are demographically similar to juveniles who are arrested. In 1987, for example, the overall delinquency case rate[95] and overall arrest rates increased consistently from 10 years of age up to 17 years of age, with drug law violation cases showing the sharpest increase in the older age groups (388).[96] The delinquency case rate was much higher for males than for females for all categories of delinquent offenses. Females received less severe dispositions than male adolescents who are arrested for similar delinquency offenses (136,387,396). In contrast, females who are arrested for status offenses receive harsher punishment than male status offenders (65,252,374).

Racial differentials in overall delinquency case rates are similar to those in arrest rates. In 1987, for example, the delinquency case rate for nonwhites was 76 percent higher than the rate for whites, with the greatest difference (209 percent higher) in offenses against persons (388). Differences in socioeconomic status and family structure have also been found among adolescents processed by the courts. State and local studies have reported that most court-processed adolescents come from low-income, female-headed households (247,387,458).

Several observers have expressed concern that the juvenile courts appear to handle nonwhite adolescents much more harshly than their white counterparts. The majority of delinquency cases involving white juveniles are handled informally (i.e., ''not petitioned''), while the majority of cases involving nonwhite juveniles are handled formally (i.e., ''petitioned'') (388). Furthermore, delinquency cases involving nonwhite juveniles are more likely to be waived to criminal court than are delinquency cases involving whites (428). It is important to note that no one has conducted an analysis of differential referral patterns that takes into account different levels of the seriousness of the offense. As noted above, arrested black adolescents have been found to commit somewhat more serious offenses than white adolescents. It is unclear whether the level of seriousness would totally account for the differences in treatment by the juvenile courts.[97]

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[92] For a discussion of maltreated adolescents and the existing child welfare services, see ch. 3, ''Parents and Families' Influence on Adolescent Health,'' in this volume.

[93] The numbers are not identical, in part because the upper age of juvenile court jurisdiction is defined by statute in each State. In some States, the upper age of juvenile court jurisdiction is 16 years of age. Thus, while arrest data maintained by the U.S. Department of Justice, Federal Bureau of Investigation includes arrests for all 17-year-olds, not all 17-year-olds are under juvenile court jurisdiction. In 1987, 1,520,325 adolescents from 10 to 17 years of age were arrested for delinquent offenses, but only 1,145,000 delinquency cases of adolescents 10 years of age and over were processed in courts with juvenile jurisdiction (410).

[94] In 1985, the fraction of status offenses cases handled by the Nation's juvenile courts was about twice as high as the fraction of serious violent offenses handled (425).

[95] The *delinquency case rate* is the number of delinquency cases per 1,000 adolescents age 10 or above who resided in the United States and were under the jurisdiction of a juvenile court. It is important to note that these data do not include status offenses (388).

[96] In 1985, the peak age for referral of delinquency offenses was 17, but the peak age for referral for status offenses was 15 and decreased for older adolescents (425). This age-specific pattern may reflect juvenile justice practices more than adolescent behavior. Juvenile justice officials often use status offense labels to deal with the minor delinquency of younger adolescents. Similar misconduct by older adolescents may be treated as delinquent violations. Also, the juvenile justice system is less willing to intercede in family or school conflicts as adolescents approach the age when they can legally leave school or their families.

[97] Racial and ethnic differences in institutionalization patterns are discussed below.

Adolescents in Juvenile Detention and Correctional Facilities

Types of Juvenile Justice Facilities—As noted in box 13-A, custodial facilities for juvenile offenders (and other minors under the jurisdiction of the juvenile or family courts[98]) can be classified along several, often overlapping dimensions that include purpose, term of stay, type of environment (institutional or open), and sponsorship (public or private) (424,428).

Juvenile detention facilities, which are usually called juvenile detention centers or juvenile halls, typically hold juveniles who have been arrested for short periods prior to adjudication (424). Such facilities may also be used for juveniles who have been found to be delinquent and are awaiting transfer to long-term placements or who have been sentenced to short periods of confinement (424). Juvenile detention facilities typically provide a physically restrictive environment. Shelters are usually short-term facilities that hold juveniles who are awaiting transfer to other placements, but they offer an environment that is not physically restricted.

Juvenile correctional facilities are facilities for the commitment and supervision and treatment of juvenile offenders whose cases have been adjudicated (424). Long-term residential facilities that serve adolescent offenders (and other adolescents) range from training schools, which typically have strict physical and staff controls, to facilities such as ranches, forestry camps or farms, halfway houses, and group homes. Ranches and forestry camps or farms tend to be less restrictive than training schools, and residents in halfway houses or group homes are allowed extensive access to community resources (424).

Juvenile facilities that have *institutional environments* typically impose restraints on residents' movements and limit access to the community. Juvenile facilities that have *open environments* allow greater movement of residents and more access to the community (428). *Public juvenile facilities* are under the direct administration and operational control of a State or local government and staffed by governmental employees. *Private facilities* are either profitmaking or nonprofit and subject to governmental licensing but under the direct administrative and operational control of private enterprise; these facilities may receive substantial public funding in addition to support from private sources (428).

Number of Adolescents in Juvenile Justice Facilities—In the course of a year, about 700,000 adolescents are confined to *public and private* juvenile justice facilities (418,424).[99] In addition there are about 479,000 juveniles in adult jails, some because they were waived to adult criminal court (254,431). The vast majority (83 percent) of adolescents in all juvenile facilities are incarcerated for nonviolent offenses (79).

Most of the adolescents in *public juvenile facilities* are in custody for delinquent offenses. About 90 percent (94 percent in 1987) of the adolescents who are in public juvenile facilities are in custody for offenses that would be considered crimes if committed by an adult (418). Most of the rest (5 percent) are held in custody for status offenses such as running away or buying liquor. A very small percentage (1 percent) are held in public juvenile facilities because they were dependent, neglected, or abused juveniles or emotionally disturbed or mentally retarded juveniles over whom a juvenile court assumed jurisdiction to ensure adequate care, or because, without having been adjudicated by a court, they were referred as "voluntary admissions" to the facility by parents, school, or a social agency (418,424).

Private juvenile facilities serve a somewhat different population. A little more than half (55 percent) of the adolescents in private juvenile facilities are in custody for delinquent offenses (about 34 percent for delinquent offenses that would be considered crimes if committed by an adult and about 21 percent for status offenses). Almost all of the remaining 45 percent of the adolescents in private facilities are dependent, abused, neglected, emotionally disturbed, or other minors over whom a juvenile court has assumed jurisdiction to ensure adequate care (429).

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[98] Minors may be under the jurisdiction of the courts for reasons unrelated to juvenile delinquency, for example, because they have been abandoned, neglected, or abused by their parents. Juvenile facilities may also be used for minors who are mentally disturbed or mentally retarded, as well as minors who are admitted by their parents or a social agency as "voluntary admissions" (418).

[99] In 1987, an estimated 590,000 juveniles were placed in public juvenile detention and correctional facilities, and perhaps another 115,000 in private facilities (446). This statistic is difficult to correlate with arrests (1,520,325) and referrals to juvenile court (1,145,000) for the same year. The statistics on arrests and referrals to juvenile court pertain to offenses, and the statistics on facilities refer to intakes regardless of the number of offenses committed by any individual, or whether any individual has been admitted multiple times. In addition, adolescents may be detained in juvenile facilities prior to or after the disposition of their cases in the juvenile court.

Trends in the Population Makeup of Juvenile Justice Facilities—Between 1977 and 1987, there was a 43-percent increase in custody rates in public and private juvenile justice facilities combined (see table 13-14).

A change also appears to be occurring in the population makeup of juvenile facilities. Although the number of juveniles in both public and private facilities increased from 1985 to 1987, data taken on a single census day in 1985, 1986, and 1987,[100] suggest that the number of juveniles held for serious (index) violent and property offenses has decreased (418,428).[101] The number of adolescents held in public and private juvenile facilities for offenses other than serious violent or property offenses, particularly alcohol- or drug-related offenses, increased 36 percent and 50 percent, respectively, from 1985 to 1987 (418,428).

Demographic Characteristics of Adolescents in Juvenile Justice Facilities—The demographic characteristics of adolescents in juvenile facilities correspond to those of adolescents arrested and to those of adolescents referred to juvenile court. Adolescents ages 14 to 17 make up by far the largest number of juveniles held in public and private juvenile facilities (429). The vast majority of adolescents in juvenile facilities for offenses that would be a crime if committed by an adult are males (89 percent). The majority of adolescents in custody in public facilities for status offenses are females (418); the majority of adolescents in private facilities for status offenses are males (428).

Nonwhite adolescents are disproportionately represented in both public and private juvenile justice facilities, but the discrepancy is greater in public facilities. On census day in 1987, almost 60 percent of the 53,503 juveniles in custody in public juvenile facilities were nonwhite or Hispanic, including 39 percent who were black (but not Hispanic), 15 percent who were Hispanic, and 3 percent who were of other racial or ethnic minority origins (see figure 13-13). By comparison, less than 40 percent of the 38,143 juveniles in private facilities on census day in 1987 were nonwhite or Hispanic (see figure 13-14).

Table 13-14—Juveniles in Custody in Public and Private Juvenile Detention, Correctional, and Shelter Facilities, 1977-87[a]

	Number of juveniles in custody/100,000 juveniles					Percent change
	1977	1979	1983	1985	1987	1977-87
U.S. total	247	251	290	313	353	+43%
Public	149	151	176	185	208	+40%
Private	98	100	114	128	145	+48%

[a] Rates are computed for juveniles ages 10 to the upper age of juvenile court jurisdiction in each State.

SOURCE: B. Krisberg, T. Thornberry, and J. Austin, *Juveniles Taken Into Custody: Developing National Statistics* (San Francisco, CA: National Council of Crime and Delinquency, 1989).

Nonwhite and Hispanic juveniles in public juvenile facilities were more likely to be placed in institutional environments than in open environments (see figure 13-13). Furthermore, there was a 15-percent increase in the number of black adolescents and a 20-percent increase in the number of Hispanic adolescents held in public juvenile facilities from 1985 to 1987 (418).

Researchers have not been able to estimate precisely the possibly differential effects of adolescent behavior and system processing in producing the disproportionate nonwhite and Hispanic presence in the juvenile justice system. Socioeconomic status, family, and community variables may also be factors. Although prejudiced justice system workers may be in part responsible, more subtle and intractable forces may also be at work. Real and perceived differences about the existence of community-based alternatives for inner-city adolescents, the strength of family supervision, and the extent of gang activity and drug trafficking in minority communities might lead some court officials to place adolescents out of their homes for reasons of child protection rather than for punitive purposes (246).

In sum, a juvenile held in a *public juvenile justice facility*—short- or long-term, detention or correc-

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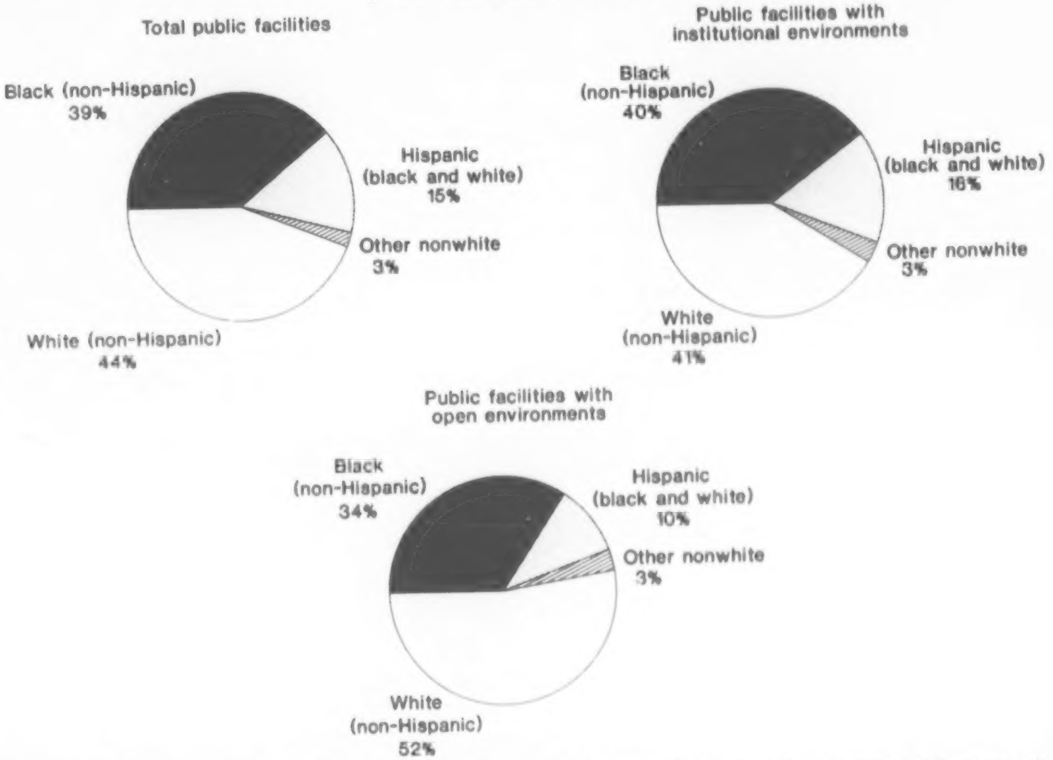
[100] The census day is the day on which the U.S. Bureau of the Census surveys more than 3,500 public and private institutions that provide custody and care for adolescents (418).

[101] The decline appears unusual since the number of arrests for serious violent and serious property offenses increased from 1983 to 1987, and from 1985 to 1987. However the two sets of data are incomparable. As noted earlier, arrest data describe number of offenses, and data on juveniles in facilities describe number of people. In addition, the trend data cited on juveniles in facilities are derived from one census day, unlike the arrest data which are derived from an annual report.

Figure 13-13—Distribution of Juveniles in Public Juvenile Justice Facilities on Census Day in 1987, by Racial and Ethnic Group[a] [b]



[a] The total population in public juvenile justice facilities on census day 1987 was 53,503. More than 90 percent of the juveniles in public juvenile justice facilities are in custody for delinquent offenses (see text).

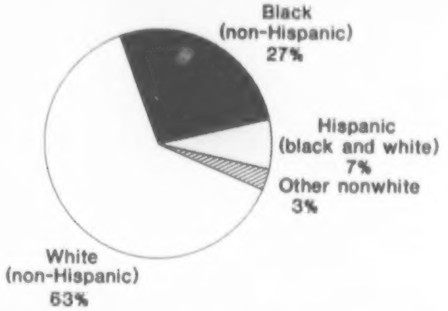
[b] According to the Office of Juvenile Justice and Delinquency Prevention, the vast majority (91 percent) of admissions to public juvenile facilities in 1987 were to facilities with institutional rather than open environments; 67 percent of admissions to public juvenile facilities were to long-term facilities and 33 percent were to short-term facilities.

SOURCE: U.S. Department of Justice, Office of Justice Programs, Office of Juvenile Justice and Delinquency Prevention, "Children in Custody: Public Juvenile Facilities, 1987," *Juvenile Justice Bulletin,* October 1988.

tional, in an institutional or open environment—is likely to be from 14 to 17 years of age, male, from a minority group, and held for committing a delinquent offense that would have been a crime if committed by an adult, most likely a serious property offense (418). A juvenile held in a *private juvenile justice facility*—short- or long-term, detention or correctional, in an institutional or open environment—is likely to be from 14 to 17 years of age, male, white, and held for committing a status offense or for reasons unrelated to delinquency (428).

The attributes of juveniles in *long-term* public juvenile facilities are somewhat different. An adolescent offender in a *long-term public juvenile justice facility* is likely to be from 15 to 17 years of age, male, white, and held for committing a serious property offense (417). The majority of adolescents under age 18 placed in long-term public juvenile facilities for serious property offenses are white, but the majority of adolescents held for serious violent offenses are black (417). Very few, indeed only 2 percent of those under age 18, are held in long-term public juvenile facilities for status offenses. In addition, the adolescent in a long-term public facility is likely to either have a seventh or eighth grade education or have completed only some high school, to have lived only with his mother while growing up, to have had a family member incarcerated at some time, to have previously been on probation, and to have been committed to a correctional institution at least once in the past (417).

Figure 13-14—Distribution of Juveniles in Private Juvenile Justice Facilities on Census Day in 1987, by Racial and Ethnic Group[a] [b]



[a] The total population in private juvenile justice facilities on census day in 1987 was 38,143. A little more than half of the juveniles in private juvenile justice facilities are in custody for delinquent offenses (see text).

[b] According to the Office of Juvenile Justice and Delinquency Prevention, the great majority (82 percent) of admissions to private juvenile justice facilities in 1987 were to facilities with open rather than institutional environments; 59 percent of admissions to private facilities were to long-term facilities and 40 percent were to short-term facilities. Racial and ethnic breakdowns by type of private facility are not available.

SOURCE: U.S. Department of Justice, Office of Justice Programs, Office of Juvenile Justice and Delinquency Prevention, *Children in Custody, 1987: A Comparison of Public and Private Juvenile Custody Facilities*, prepublication draft, Washington, DC, 1989.

The Effectiveness of the Juvenile Justice System

The aims of the juvenile justice system—though the systems in each State vary—are to provide for the protection and safety of the public and to provide for the protection of the best interest of each minor under the jurisdiction of the court.

In the case of juvenile offenders, there are two contending ideologies that underlie efforts to advance these aims—treatment[102] and punishment. In theory, the juvenile justice system is based on the notions that juveniles are more capable of reform and less responsible for their actions than adults. Consequently, the concept of retribution and punishment might be expected to be less pronounced in the juvenile justice system than it is in the adult criminal justice system.

In practice, it would appear that services based on both treatment and punishment are used to varying degrees in most State juvenile justice systems, but little information is available on the specific services provided, particularly in institutional juvenile facilities. The disparity in ideologies and the need to balance them has led to disagreement on exactly what should be measured to evaluate the effectiveness of the system in general and the effectiveness of specific treatment interventions, as well as about the most appropriate measurement techniques.

In the discussion that follows, OTA has considered three measures in evaluating the effectiveness of the juvenile justice system as a whole:

- effects on adolescents while they are in the juvenile justice system;
- effects on the public while adolescent offenders are in custody;
- effects on the public and adolescent offenders after adolescent offenders leave the system.

As noted earlier, the focus of this discussion is the juvenile courts and juvenile detention and correction facilities.

Effects on Adolescents While They Are in the Juvenile Justice System

To what extent are the best interests of adolescents protected during the period they are in the juvenile justice system? This question can be answered by considering two measures:

- sensitivity to adolescents' developmental status and
- protection of legal rights.

The extent to which the juvenile justice system—in particular, juvenile courts and juvenile detention and correctional facilities—exhibits sensitivity to the developmental status of adolescents during the processing of cases varies. The juvenile court can be said to be effective in protecting the best interests of adolescents who have not reached the age of majority in that its central premise is that juveniles should be treated differently from adults. The juvenile court's jurisprudence assumes that juveniles possess somewhat less responsibility for their actions than adults (467) and thus often handles cases involving juveniles on an informal basis (388,415). Nonetheless, the juvenile justice system today is more formal and punitive in its treatment of adolescent offenders than it was 20 years ago. From the early 1970s to 1987, the proportion of adolescents referred to court after being taken into custody by the police increased from about 50 percent to 62 percent, the use of diversion and probation declined, and the proportion of juveniles arrested and referred to adult courts rose from 1 percent to 5 percent (250,409). Furthermore, juvenile confinement rates (i.e., the number of juveniles in custody per 100,000 juveniles) increased by 43 percent between 1977 and 1987 (see table 13-14).

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[102] The terms treatment and rehabilitation are often used synonymously in the criminology literature. From some perspectives, of course, punishment is also rehabilitative.

The processing of cases in the juvenile justice system does not operate with a consistent understanding of adolescent development. In general, younger adolescents (usually below age 13) are less likely to be detained or placed out of their homes than their older counterparts (387). Status offenders are an exception. Younger status offenders are slightly more likely to be held or placed out of their homes than older status offenders, which may reflect the court's child protection philosophy. The age at which the death penalty can apply to a juvenile, however, remains controversial.[103]

State juvenile justice systems vary in the extent to which they manage adolescents on the basis of age or maturity. In as many as 20 States, juveniles awaiting adjudication continue to be held in adult jails despite a Federal mandate in the Juvenile Justice and Delinquency Prevention Act of 1974 that juveniles be held in separate facilities (392).[104] Once their cases have been adjudicated, juveniles can be housed separately from adults (e.g., Illinois) or mixed with adult offenders (e.g., Texas), and juveniles who are being tried as adults can be placed in a juvenile facility (e.g., Illinois) or in an adult jail (e.g., California). Adolescents held in adult facilities are often physically and sexually abused by inmates and staff (254), and suicide rates among adolescents in jails are higher than for adolescents held in juvenile facilities (360). Thus, it is important for adolescents to be held in juvenile rather than adult facilities.

Whether the juvenile justice system is effective in protecting the legal rights of adolescents awaiting adjudication is problematic (130). Some adolescents lack access to appropriate counsel,[105] closed hearings may not be protective,[106] and the quality of some juvenile court judges has been questioned (see 246).

Whether the juvenile justice system protects adolescents who have been adjudicated delinquent and institutionalized in juvenile facilities is also problematic. Despite years of litigation pertaining to the issue, adolescent offenders' right to treatment, i.e., benefits, assistance, and therapeutic programs, remains unsettled (254).[107] Thus, it is not surprising that, as discussed in detail later, the juvenile justice system has not been effective in providing necessary health services to adolescent offenders with preexisting problems or in preventing the development of additional health conditions. It is also questionable whether educational services provided to adolescents in juvenile facilities are adequate (254).

Effects on the Public While Adolescent Offenders Are in Custody

A critical measure of the effectiveness of the juvenile justice system from the public's standpoint is the extent to which the public is protected for the period that adolescent offenders are in custody in juvenile detention and correctional facilities. There are no data on the incapacitative effect of the juvenile justice system on society at large, but clearly, those adolescents who are institutionalized are not able to commit offenses against the noninstitutionalized public.

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[103] In *Wilkins* v. *Missouri* (57 U.S. Law Weekly 4973) (1989), the U.S. Supreme Court refused to set a higher minimum age for executions than 15, which was established in an earlier ruling, despite briefs filed by the American Bar Association, the National Council on Crime and Delinquency, the Children's Defense Fund, among others, urging that age 18 should be the constitutional minimum age.

[104] State policies regarding holding juveniles in adult jails are highly diverse, in part because States vary as to the upper age for juvenile court jurisdiction (see table 13-12).

[105] Most adolescents handled by juvenile courts come from low-income families (245,387,457), and they rely heavily on public defenders and assigned counsels for legal representation. In appointing public defenders and assigned counsels to adolescents, however, the training and performance of these individuals is not always considered (246). Furthermore, many adolescents and their families have been reported to waive their right to any counsel without full comprehension of the consequences of that decision (176,360).

[106] Juvenile courts hold closed hearings for cases involving adolescents in part to shield adolescents from negative publicity in high profile cases. They have not been particularly successful in doing this and some experts think the hidden nature of juvenile court operations contributes to perceptions that the court is overly lenient. Where open hearings have been tried, there have been few negative consequences for juveniles (360).

[107] According to Lambert and others, minimum treatment includes "the right to freedom from harm while in state custody and requires that youth be provided adequate food, shelter, and clothing; academic, vocational and physical education; medical care, social services, and psychiatric services; supervision by trained staff; recreation, and the opportunity for phone calls and visits" (254).

Concerns about the need to protect the public from serious violent offenders are probably greater than concerns about protection from other juvenile offenders. It is important to recognize, however, that most serious violent juvenile offenders do not remain in the juvenile justice system but instead are more likely to be transferred to adult court for trial and sentencing (415). From the early 1970s to 1987, the proportion of juveniles arrested and referred to adult courts rose from 1 percent to 5 percent (250).

Effects on the Public and Adolescent Offenders After Offenders Leave the Juvenile Justice System

The juvenile justice system as a whole would be considered effective for both the public and adolescent offenders if the adolescents leaving the system were socially well adjusted. Some theorists have argued that formal adjudication and the threat of further punishment suppress further delinquent behavior (296); other theorists have claimed that official processing may actually increase delinquency (444). Neither of these positions has received conclusive empirical support.

Indeed, an evaluation based on the measure of adolescent offenders' social adjustment following release from juvenile detention and correctional facilities is currently not possible, because few State juvenile justice systems routinely collect any data on confined adolescents after they leave the system. The only data collected currently—and only by some systems—are data on how many adolescent offenders receive high school equivalency certificates based on the general educational development (GED) test, how many hours of community service are performed, or how much restitution is paid to victims.

The most common indication that adolescents who had been in the juvenile justice system are socially adjusted is lower subsequent delinquency or criminality as measured by recidivism—that is, the falling back into delinquent or criminal behavior after punishment. Recidivism has face validity as a measure of subsequent delinquency or criminality, but it is important to note that there is no standard measure of recidivism. Many measures are used including rearrest, readjudication, and reincarceration, each of which is a distinctly different outcome (338). Furthermore, assessing the extent to which recidivism reflects changes in individuals' behaviors or in system responses is difficult, if not impossible (246). Data are limited on all measures because most State juvenile justice systems do not routinely collect any type of recidivism information. Those that do collect such information use measures of recidivism that are not comparable among jurisdictions.

One of the few empirical studies that collected data on multiple measures of recidivism had inconclusive results regarding the effectiveness of juvenile justice systems in decreasing subsequent delinquency and criminality of adolescents in juvenile institutions (251). That study collected followup data on rearrests, reconvictions, and reincarcerations of individuals who had formerly been in the juvenile justice systems in Massachusetts, Pennsylvania, Utah, Florida, Texas, Illinois, Wisconsin, and California.

Overall, the followup data indicated that a large proportion of the individuals who had formerly been in juvenile justice systems in the aforementioned States were subsequently arrested. A somewhat smaller proportion of them were convicted within 12 months, and at least half of them were reincarcerated within 36 months (251).[108] These data suggest that the effectiveness of the juvenile justice system in deterring subsequent delinquency and criminality is questionable.

Several hypotheses have been advanced to explain why many offenders who have been confined to juvenile institutions appear to improve in terms of serious delinquency or criminality. One is that court interventions may have deterrent or rehabilitative effects (249,296). Another is that the improvements may be simply statistical artifacts and maturation effects (274). Self-report data show that the duration of serious and violent offense careers among adolescents, whether or not the adolescents have been arrested or confined, is very short (96). At present, there is insufficient empirical evidence to choose among these competing hypotheses.

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[108] Twelve-month followups of rearrests found that rates of rearrest ranged from roughly 50 percent in Massachusetts and Pennsylvania to over 70 percent in California and Utah (251). Rates of reconviction ranged from 43 percent to 53 percent, and a 36-month followup of reincarceration rates showed wide variation from 25 percent to over 60 percent (251).

The Effectiveness of Specific Treatment Interventions for Delinquent Adolescents

Interventions for treatment of delinquent adolescents are of two general types:

- interventions provided in institutional environments, which tend to greatly restrict residents' freedom of movement and access to the community (e.g., training schools and ranches), and
- interventions provided in community environments or in juvenile facilities with open environments (e.g., shelters, halfway houses, and group homes) (415).

Available evidence on the effectiveness of specific institutionally based and community-based treatment interventions for delinquent adolescents is reviewed below.

Evaluations of the effectiveness of specific treatment interventions for delinquent adolescents exhibit several problems. One problem is that although most evaluations rely on recidivism as a measure of the effectiveness of specific interventions, different evaluations define recidivism in different ways; numerous evaluations merely report "success" rates without defining the term success.

Another problem is that the effects of a specific treatment intervention on a delinquent adolescent are often difficult to distinguish from the effects of other aspects of the adolescent's involvement in the juvenile justice system, particularly if an adolescent has been brought to the point of adjudication.

Still another difficulty in evaluations of the effectiveness of specific treatment interventions for delinquent adolescents is that most evaluations appear to assume, often incorrectly, that juvenile offenders are a single, homogeneous category (16, 308,346) and that programs that go by the same general name (e.g., group homes) provide the same type of service (74,264).[109] The effectiveness of treatment for delinquent adolescents is believed by many criminologists to be the result of an interaction between offender characteristics and treatment types (295). Evaluations of treatment interventions for delinquent adolescents would be easier to conduct, and interpretations clearer, therefore, if treatment designs matched or tracked the specific type of treatment with the particular characteristics of the individual adolescent offender or family.

Institutionally Based Treatment Interventions

Treatment interventions provided for delinquent adolescents in institutional environments, such as training schools and ranches, may be used for adolescent offenders who have been officially adjudicated by a court. Unfortunately, the weight of the evidence does not lend much support to the idea that an effective technology of treatment for delinquent adolescents in institutions has been developed.

There is some indication that institutionally based treatment interventions that primarily emphasize comprehensive control and supervision and are grounded in an ideology of punishment are ineffective at reducing recidivism particularly for very difficult adolescents (173,174).

Many States also have proposals or programs for "boot camps"—also known as shock incarceration programs—to make the time spent in an institution an unpleasant, but potentially discipline-inducing, experience. These programs are primarily for young nonviolent offenders serving time on their first felony convention (427a). Evidence for the effectiveness of such programs is anecdotal, and a clear assessment of their relative value is not possible at this time. There is some evidence, however, that boot camp recidivism rates are approximately the same as these of comparison groups who serve a longer period of time in a traditional training school or who serve time on probation (423a).

Whether institutionally based treatment interventions that, for the most part, reject the concept of punishment and are oriented to treatment of adolescent offenders through psychological change are effective at reducing recidivism is not known. Although the question has been studied, the results to date have been inconclusive. Three rigorous reviews of such interventions had three different findings: a finding of little evidence of effectiveness (253); a finding of an overall positive effect (152); and a finding that "appropriate" correctional treatments are more effective than criminal sanctions, inappropriate treatment, or unspecified treatment and that they cut recidivism rates in half on the average (14).[110] Despite the sophistication and comprehensiveness of these analyses, it seems that interpretations of the available data appear to rest as much on the depth and style of analysis as on the actual data (295).

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[109] There have been several promising attempts to differentiate types of delinquents (1,307,324,327) and dimensions of programs, but only a few studies (221) have made any systematic attempt to relate types of delinquents to treatments in terms of effectiveness, and these studies have been methodologically flawed.

There is some evidence that particular rehabilitative treatment strategies provided to adolescent offenders in institutions are more effective than others. Overall, studies have found that behavioral approaches such as point systems, token economies,[111] behavioral contracting (14,152,222), cognitive problem-solving and skill development (367), and family therapy interventions (32) are more effective in reducing recidivism than are peer group counseling (169) or individual therapy (152,173).

That evaluations of treatment interventions for delinquents provided in institutional settings have not shown particularly impressive results is perhaps not surprising. Making any treatment intervention for delinquent adolescents work in an institutional environment presents a set of formidable challenges (339). For various reasons, motivating incarcerated adolescents and staff to participate actively in an intervention is extremely difficult. One reason is that the adolescent offenders who are placed in institutional environments are often young people for whom much else has not worked. Moreover, some institutional environments have an overwhelming ethos of social control that can easily compromise even the most sound approach to behavioral change.

Community-Based Treatment Interventions

Treatment interventions provided for delinquent adolescents in community environments or in juvenile facilities with open environments (e.g., shelters, halfway houses, group homes) may be used for adolescent offenders of various types.

Innovative community-based treatment interventions range from *diversion programs*, which seek to limit delinquent adolescents' involvement with the juvenile justice system beyond their initial contact with the police, to variations on standard community *probation*, which may entail minimal supervision, to *residential placements*, which may differ only slightly in terms of atmosphere and community access from institutional placements (74). Adolescents who participate in diversion programs are usually delinquents whose offenses are not severe (i.e., official or self-reported status offenders or minor offenders). Most participants in the other types of community-based treatment programs described below are official serious and chronic offenders whose cases have been adjudicated.

Diversion Programs for Delinquent Adolescents[112]—Diversion programs seek to reduce the number of juveniles processed by the juvenile justice system by limiting the number passed into courts and custodial facilities and limiting the number at each stage of processing by diverting juveniles to other social control institutions (e.g., the family, schools, child service agencies) or community-based services.

The evidence on the effectiveness of diversion programs in preventing continued adolescent involvement in the juvenile justice system is mixed. Several evaluations of diversion programs nationwide have indicated that such programs have had little effect on subsequent arrest rates of adolescents in the programs (242,368). A carefully done comparative study of four different diversion programs also showed no difference between diverted and processed youth on either self-reported or official delinquency after a year (91). In addition, adolescents who previously would have been warned and released were diverted into community programs, paradoxically expanding rather than reducing the number of juveniles handled by the system (21,47,321).

However, some diversion programs have been reported to be successful (e.g., 31,46). One series of carefully designed and implemented studies (82,83,84) consistently showed the effectiveness of an 18-week intervention by paraprofessionals using behavioral contracting and advocacy strategies in reducing rearrest rates for up to 2 years following program involvement (82). However, the 18-week intervention did not reduce self-reported delinquent behavior (83). Another study found significant decreases in recidivism rates among adolescents in diversion programs in Colorado (334).

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[110] "Appropriate" community-based treatments were identified by the authors of the study as 1) treatments in which the more intensive service option was delivered to higher risk cases; 2) all behavioral treatments except those involving delivery of services to lower risk cases; and 3) nonbehavioral treatments that clearly stated that criminogenic need (i.e., dynamic risk factors that are predictive of criminal involvement) was targeted and that structured intervention was used (14).

[111] *Token economies* reward offenders for competence with points redeemable for money and desirable goods.

[112] Diversion programs, specifically those that are targeted at adolescents who have not been officially classified as offenders, are sometimes considered secondary prevention programs. Indeed, most diversion is done by police and only a small proportion of police contacts with adolescents ever result in an arrest and further processing (270). Although such adolescents do not satisfy the legal definition of delinquency, they do satisfy the behavioral definition and are therefore included in this section on specific treatment interventions.

Another well-designed study found positive effects of an intervention that integrated identified antisocial adolescents (who were referred by schools and the juvenile court before they progressed into the juvenile justice system) into activities with nondisturbed peers (132). This soundly designed study found reduced self-reported and official delinquency in targeted youths who participated in groups with higher numbers of nonreferred youths run by experienced group leaders.[113] Although the sample was small, the soundness of the design and concurrent evidence of positive modeling effects from other investigations (e.g., 355) suggest replicating the intervention.

Restitution Programs—Restitution programs can decrease an offender's likelihood of readjudication (357,359). Restitution programs require adjudicated offenders either to pay their victims directly to compensate for the victim's loss or to perform a specified amount of public service. Sometimes, restitution programs also involve direct mediation between the offender and victim (212,357). Despite the promise of such programs, overall questions remain about the conditions necessary for restitution programs to work.

Group Homes—Of the residential placement options in community treatment, one of the most popular is the group home. One model of a group home is the Teaching Family Model—a model in which a trained couple live with about six chronic delinquents and administer a systematic behavioral system of points and privileges to guide the adolescent's behavior. The adolescents typically attend local public schools (327). This model appears to reduce adolescents' behavior problems during treatment, but these effects disappear after adolescents leave the group home (49,241,327).

Wilderness Camping Programs[114]—Wilderness camping programs have not been sufficiently evaluated (295) to justify claims of their effectiveness (173). A few studies have shown positive effects (238,456), but, in general, the programs have failed to show lasting reductions in recidivism rates or to document the relevance of these programs for the subsequent adjustment of participants in their communities. They appear to have potential benefit for some participants, but the nature, extent, and conditions under which positive outcomes occur is unknown.

Intensive Probation Programs—Intensive probation programs in lieu of institutional placement are becoming more widespread (17,18). The most recent evaluation of these efforts (34) compared the outcomes of serious and chronic adolescent offenders assigned to intensive probations with those of a similar institutionalized control group. After 2 years, the recidivism rates, as measured by arrests and self-reported delinquency, were similar, although the control group's charges were more serious. The intensive supervision programs, however, are reported to cost less than one-third as much as the average State commitment (34). In 1986, for example, the intensive supervision programs were reported to cost an average of $26 per day for each participant as compared with commitment costs of an average of $88.54 (34).

Family Therapy and Family Communication Skills Training—Family therapy and family communication skills training has been used as a treatment for families of delinquent adolescents. Several studies have shown that, in the short term, family systems approaches cut recidivism rates by half in comparison with more traditional forms of psychotherapy (client-centered relationship therapy, psychodynamic therapy) and no treatment comparison groups (2,166) and have a greater impact on child and family functioning than other types of therapy (198,236,314).

Preliminary results from an evaluation of a multisystemic psychotherapeutic[115] approach to treating the families of delinquent adolescents show marked reductions in family dysfunction and official delinquency; further exploration of such intensive interventions seems warranted (197). Since most family interventions for delinquency have experienced nearly a 50-percent dropout rate (186), however, the targeted child's and family's characteristics, as well as methods for making adherence more attractive to families, are all factors that must be investigated further if these initial developments in family approaches are to be expanded. It is clear that dropout families tend to have older children (141), to be poorer and more stressed, to be headed by single parents (275,335), and to have fewer social supports (89,438). Patterson and his colleagues have also been less successful with older, chronic delinquents than with younger, aggressive children (275, 335).

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[113] Feldman has noted the importance of an experienced and well-trained adult leader in programs that involve adolescents (132).

[114] Although a variety of organizations offer somewhat different outdoor experiences for adolescents, all of the approaches rely on the natural stresses and contingencies provided by the wilderness to encourage personal development and group cooperation.

[115] The multisystemic approach to psychotherapy differs from more traditional approaches in that all elements of the identified client's ecological system (including schools, sports teams) are included in the treatment as needed. Treatment approaches are flexible rather than theoretically rigid and may be delivered in settings other than the clinician's office (e.g., adolescents' homes and schools). In addition, the multisystemic approach emphasizes the utilization of theoretical findings in developmental psychology (197).

Comparison of Community-Based and Institutionally Based Treatment for Delinquent Adolescents

A major debate in the juvenile justice field centers on the relative advantages of community and institutional treatment for juvenile offenders. Although a meta-analysis of community-based treatment programs for delinquent adolescents produced consistently positive effect sizes (170), available studies comparing the effectiveness of community-based and institutionally based treatment have produced conflicting results (113,271,296).

Probably the most relevant natural experiments were interventions first attempted by Massachusetts and later by Utah, Pennsylvania, and Vermont. These four States deinstitutionalized adolescent offenders and returned them to their communities or transferred them to small, community-based residential facilities.[116] Evaluations found that the deinstitutionalization of adolescent offenders was not followed by an increase in the frequency or seriousness of juvenile crime in Massachusetts and Utah (245,248,382) or in the other States (382). Studies of the Massachusetts experiment found that the community circumstances to which the adolescents returned affected their adjustment to deinstitutionalization (75). Adolescents who returned to communities with alternative, nonresidential programs were half as likely to be rearrested as adolescents who were merely placed on informal probation (75). Moreover, adolescents who returned to social networks that included delinquent peers were more likely to be rearrested than adolescents who reported having a positive relationship with at least one law-abiding adult (74).

Two recent methodologically sophisticated studies that have produced some seemingly sounder results may clarify the situation with respect to the relative advantages of community-based and institutionally based treatment interventions for delinquent adolescents. One of the studies examined the outcome of 11 different dispositions ranging from outright release to a combination of more than 2 months detention with 2 years probation (460). This study found several counterintuitive interactions among length of treatment, type of treatment, and setting. Shorter periods (under 1 year) of supervision without treatment appeared more effective than extended supervision; both short-term (under 2 months) institutional treatment and longer term (over 2 years) community-based treatment were relatively effective in reducing recidivism. The other study examined community-based and institutional residential interventions and found that "appropriate" community-based treatment (as defined in a previous footnote) produced stronger effects on recidivism than did institutionalization (14). In this study, all community interventions were nonresidential. Types of community treatment were not differentiated from each other in the main analyses, because preliminary analyses indicated that the different community settings had recidivism results that were statistically indistinguishable; as a group, they were found to be more effective than the institutional settings (14). The methodological sophistication (e.g., a clearer definition of treatment and control of other influences on recidivism) of these two studies increases confidence that community-based treatments for delinquent adolescents are more effective at reducing recidivism than are punishment or treatments in institutions, as long as the treatment is appropriate and extensive.

There are few rigorous analyses of the cost-effectiveness of various juvenile justice interventions. Some observers consider the question of the cost-effectiveness of the different approaches to be an open question (243,342,382). Other observers contend that substantial fiscal savings are realized through the extensive use of community-based programs in lieu of training schools (e.g., 245,248). Controlled studies that take into account the total cost for equivalent treatments, including startup costs, in community and institutional settings are needed to address this issue.

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[116] Massachusetts placed about 15 percent of youths committed to the Department of Youth Facilities in locked facilities; the remaining 85 percent were managed in small group homes, foster care placements, day treatment programs, and intensive supervision programs (245,248).

Health Care in Juvenile Justice Facilities

By almost any yardstick, the juvenile justice system in this country has not been effective in providing necessary health services to incarcerated adolescent offenders. Though most available information on health care in juvenile justice facilities is over 10 years old, the few more recent studies do not suggest major improvements in health care provided to incarcerated adolescents. The composite picture that emerges from a review of the research is one of continuing inattention and neglect of the health status of incarcerated adolescents. As discussed further below, adolescents entering detention and correctional facilities tend to have poorer health histories than their nonincarcerated counterparts and are frequently suffering from significant health problems at the time of admittance. Once admitted to a correctional facility, they face substantial health risks *within* the facility and may be unable to obtain appropriate medical treatment when they are ill or injured.

As reported by two independent series of investigations, incarcerated juvenile offenders tend to have medical histories that show higher rates of perinatal problems, previous hospitalization, trauma (including head trauma), parental abuse, and neurodevelopmental problems than are found among nondelinquent youth (260,261,305,370). Existing inventories of the health problems of incarcerated youth reveal that juvenile offenders have a broad range of preexisting health conditions before incarceration (9,461). That many of these preexisting conditions may not have been appropriately treated is suggested by at least one study, which found that 34 percent of adolescent offenders (as compared with approximately 8 percent among nonoffending adolescents) did not have a consistent source of health care (260).

The health problems of adolescents entering juvenile facilities and of adolescents after they are incarcerated are discussed further below. Also discussed is the quality of health care in juvenile custodial facilities, primarily institutional.

COUNTY OF FAIRFAX
JUVENILE HOLDING FACILITY
KEYSTONE BUILDERS
CONTRACTOR

Photo credit: Office of Technology Assessment

The health care of adolescents in juvenile confinement is a serious cause for concern because adolescents in confinement have a greater than average number of health problems, because their health problems may increase during confinement, and because only 1 percent of eligible juvenile justice facilities have been accredited as meeting existing voluntary standards for providing health care.

Health Problems of Adolescents Entering Juvenile Justice Facilities

Nutritional problems and physical illnesses are quite common among adolescents entering juvenile justice facilities. Studies have identified high rates of iron deficiency (a marker of poor nutritional status), upper respiratory tract infections, psychosomatic problems indicative of stress (headaches, sleep disturbances, abdominal complaints, lethargy, and poor appetite), dental and skin problems, minor trauma, and congenital malformations, among other problems (7,193,347).

Many adolescents entering juvenile justice facilities have significant mental health problems—particularly depressive disorders, which are often accompanied by feelings of hopelessness and low self-esteem (217). Various studies have estimated that 15 to 23 percent of adolescents entering juvenile facilities have mental health problems (67,233,281). It is important to note, however, that the aggregate rates of mental health problems among juveniles entering juvenile facilities are not different from those in the U.S. adolescent population.[117]

Adolescents entering juvenile facilities do tend to have a higher level of experience with drugs and alcohol than the general adolescent population, and nearly universal use of tobacco (60,193,228,266,422).

There is some evidence that female adolescents entering juvenile justice facilities are more sexually active than other female adolescents, possibly accounting for high rates of sexually transmitted diseases at the time of admission.[118] Virtually all of the detained female adolescents in a 1981 study in New York City were sexually experienced by the time they were age 15, whereas only 25 percent of a national noninstitutionalized urban sample had a similar level of experience (194,464). In a 1985 study of female adolescents detained in King County, Washington, 81 percent of the females complained of vaginal discharge and only 8 percent had no genitourinary symptoms (39). Although none of these adolescents were diagnosed with syphilis, 48 percent had trichomoniasis, 20 percent had chlamydia infection, 18 percent had gonorrhea, and 4 percent had early signs of cervical cancer. In another study of adolescents detained in New York City during 1983-84, gonorrhea was diagnosed in 18 percent of the females and 3 percent of the males, while syphilis was detected in 2.5 percent of the females and 0.6 percent of the males (3).

Health Problems Experienced by Adolescents During Incarceration

If adolescents admitted to juvenile justice facilities are already comparatively unhealthy at the time they are admitted, once inside an institutional correctional facility, they frequently are exposed to additional risks.

Suicide poses a significant risk for adolescents who are incarcerated in juvenile and adult institutions (289). In 1984, the estimated suicide rate for juveniles incarcerated in public correctional facilities was 22.6 deaths per 100,000 adolescents in the population at risk—a rate of suicide 2.5 times higher than the rate for adolescents in the general population (9,292).[119] In addition, 12 percent of juvenile correctional institutions reported at least one death by suicide within a 5-year period (15). Minors appear to be at especially high risk for suicide if they are detained in adult jails (9,354).

Confinement in juvenile correctional facilities may expose adolescents to institutional procedures that can have adverse health consequences (79). Lack of sufficient staff, for example, may encourage inappropriate use of psychotropic drugs or physical restraints to control behavior. Inadequate supervision may increase the hazard of suicide or assault. And isolation or disciplinary procedures may be abusive or excessively punitive in some facilities (9).

One major health problem for adolescents during incarceration in residential facilities appears to be trauma, although this problem has not been well-studied. A 1985 study found that about half of the residents of one coeducational training school required medical attention for traumatic injuries—one-third of which resulted from fighting or self-inflicted wounds (462). More than one-quarter (28 percent) of the injured adolescents in the 1985 study required attention at an off-campus facility, and one-fifth (21 percent) of injuries needed radiologic or laboratory studies; 4 percent of the injuries necessitated hospitalization (462).[120] In another study, 37 percent of the subjects described deliberately harming themselves (without suicidal intent) during the period of their incarceration (216).

Quality of Health Care in Juvenile Justice Facilities

Given the preexisting physical and mental health problems and the documented health risks confronting adolescents committed to juvenile facilities, an important question is: What is the quality of care provided in these institutions? Addressed below are the studies that have investigated this question, the standards that have been promulgated in an effort to enhance the quality of care, and selected financing barriers (i.e., in Medicaid) to expanding the provision of care in juvenile correctional facilities. Finally, issues regarding continuity of care when adolescents are released from juvenile justice facilities are discussed.

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[117] For a discussion of the prevalence of mental health problems among U.S. adolescents, see ch. 11, "Mental Health Problems: Prevention and Services," in this volume.

[118] For a discussion of the prevalence of sexually transmitted diseases among adolescents, see ch. 9, "AIDS and Other Sexually Transmitted Diseases: Prevention and Services," in this volume.

[119] For a discussion of adolescent suicide, see ch. 11, "Mental Health Problems: Prevention and Services," in this volume.

[120] For a discussion of accidental injuries among adolescents, see ch. 5, "Accidental Injuries: Prevention and Services," in this volume.

Studies of Quality of Care in Juvenile Correctional Facilities—At least three separate studies have investigated aspects of the quality of care and concluded that many juvenile correctional facilities provide inadequate health and medical care for the adolescents in their charge.

One of the three studies explored how well medical specialists in one residential facility detected health problems of juveniles during evaluations at the time of admission (262). This study found that medical providers at the facility frequently failed to identify important health status information, including data relevant to their fields of expertise (e.g., pediatrics, neurology, and psychiatry).

The other two studies explored the availability of health services for juvenile offenders in custody. One, Anno's 1984 analysis of responses to questionnaires sent to 600 juvenile facilities, found that only two-thirds of the 215 responding facilities met the American Medical Association's standards for frequency of sick calls[121] and the use of qualified health care personnel (15). Although almost three-quarters of institutions (72 percent) completed full health appraisals within a week of each adolescent's admission, 40 percent of the institutions did not routinely provide medical screening on admission, and more than half (58 percent) of the facilities used nonphysician staff to conduct screenings. Three-fourths (76 percent) of the facilities holding minors awaiting adjudication and one-fifth (18 percent) of the facilities holding minors who already had been adjudicated did not provide ongoing mental health services. Fewer than half (42 percent) of institutions provided dental services on a continuing basis.

The other study that explored the availability of health services for juvenile offenders was a statewide survey of 25 institutional facilities in Georgia (219). This study found that the frequency of sick calls at these facilities varied from 4 days a week to once every other week, although 1 day per week was the most common. Although other findings of this survey were not quantified, the study investigators did raise concerns about inappropriate use of hospital emergency rooms, nonstandardized screening, high staff turnover and low morale, confusion about the legal and medical rights of incarcerated adolescents, and inadequate medical care budgets.

Standards for Health Care—As noted above, two of the three studies that have investigated the quality of care provided in juvenile correctional facilities used existing sets of standards as a basis for comparison. The American Academy of Pediatrics wrote one of the first sets of standards for the health care of juveniles in juvenile facilities in 1973 (5). The American Medical Association developed a set of standards for health services in juvenile facilities in 1979 (8). In 1984, 20 national professional health care organizations developed a comprehensive set of standards for the provision of health care in juvenile correctional settings. These "Standards for Health Services in Juvenile Confinement Facilities" were drafted and released by the National Commission on Correctional Health Care.[122] They specify that health services in juvenile correctional facilities should be equivalent to those available in the community (79).[123]

Compliance with any of the existing standards for the health care of juveniles in juvenile confinement facilities is completely voluntary. As of 1990, only about 32 of the more than 3,000 juvenile facilities in the country were accredited by the National Commission on Correctional Health Care—and those 32 were predominantly in Los Angeles, California, and the State of Washington (64).

Thus, voluntary standards for the health care of juveniles in juvenile confinement facilities apparently have not been successful in fostering improvements in the quality of health care provided in juvenile facilities. Intervention by the judicial branch is another approach to forcing improvements. The issue of whether incarcerated juveniles have a constitutional right to treatment, however, is unsettled. On the one hand, the U.S. Supreme Court has never decided whether incarcerated adolescents have a constitutionally based right to treatment, and some Federal courts have ruled that incarcerated children do not enjoy the right to treatment (79,254). On the other hand, many Federal courts have held that denial of adequate medical and mental health care violates the Eighth and Fourteenth Amendments to the U.S. Constitution (79). Accordingly, Federal courts have required some juvenile correctional facilities to provide routine and emergency medical and mental health care (79). One might expect alleged deficiencies in health care within juvenile correctional facilities to be a common subject of litigation. Yet legal challenges to the quality of care in juvenile justice facilities are fairly rare occurrences.[124]

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[121] *Sick calls* are periodic opportunities provided by institutions for health status checks and for persons to declare illness or health problems and be relieved from the daily schedule in order to receive health assessments or treatment. The standard adopted by National Commission on Correctional Health Care for accreditation of juvenile custodial facilities requires sick calls to be conducted by a physician or nurse at the site of the institution's clinic (300). Under this standard, a facility of less than 50 juveniles must have its clinic open for sick call at least once per week. Facilities with 50 to 200 juveniles in residence must open their clinics at least three times during the week. For facilities with a resident juvenile population over 200, clinics must be open for sick call 5 days per week. OTA did not evaluate the validity of the National Commission on Correctional Health Care standards.

[122] There are also other voluntary model standards for the health care of incarcerated juveniles (298).

[123] Nonetheless, some question the adequacy of the standards. They do not, for example, prohibit the health care professional from cooperating in the inappropriate use of medical procedures for punitive and control purposes (79).

Medicaid Barriers—Many factors contribute to the problems surrounding health care delivery in juvenile correctional institutions. Fiscal pressures faced by juvenile correctional facilities have been reported to be among them (9). In this respect, current Federal restrictions on Medicaid reimbursement are significant, especially since few incarcerated adolescents can be expected to have private health insurance.

Existing Federal regulations do not permit Medicaid to pay for medical and health-related services provided in publicly funded juvenile correctional institutions (42 CFR 435.1009). Health care in juvenile correctional institutions is supported exclusively by State and county governments, frequently as a line item expense in an institution's total operating budget (217). Within a particular institution, therefore, health and medical needs compete with other organizational needs. Medical care personnel may be forced to ration evaluation and treatment resources. Paying for the costs of a simple hospitalization, especially if any operative procedure is involved, may seriously compromise an institution's budgetary capability to provide for the health and medical needs of other youth.

Continuity of Care—If the quality of care within many juvenile correctional facilities is often inadequate, adolescents, upon leaving the institutions, seem to face yet another problem. In a juvenile correctional facility, continuity of care optimally includes discharge planning by medical staff to assure uninterrupted provision of health care for the adolescent. Service fragmentation prevents full implementation and coordination of care during an adolescent's transition from an institution back to the community (9). Upon release from a correctional institution back to the community, for example, a juvenile may become eligible for the Medicaid reimbursement denied during incarceration. The switch from one source of funding for health care to another source at the time of an adolescent's release into the community may complicate the coordination of service delivery. Many incarcerated adolescents are moved among different community placements and have no regular source of health care. Thus, their health care after discharge may be left to the vagaries of circumstance.

Summary: Services and Interventions for Adolescents in the Juvenile Justice System

As a country, the United States spends billions of dollars annually on its juvenile justice system. An important question to consider, therefore, is whether the funds that are allocated are obtaining the desired results of protecting the public safety and providing for the protection of the best interests of each adolescent in the juvenile justice system for delinquent offenses.

One measure of the juvenile justice system's effectiveness is whether it serves adolescents' best interests *while* they are in the system. OTA's analysis suggests that services and interventions for adolescents in the juvenile justice system are frequently not provided with an understanding of the developmental status of adolescents and a recognition of the legal rights of adolescents (e.g., access to legal counsel).

Another measure of the effectiveness of the juvenile justice system is how well it serves the public safety and adolescents' best interests *after* they leave the juvenile justice system. The juvenile justice system would probably be considered effective if adolescent offenders were deterred from subsequent delinquency and criminality after contact with the system. Because of a lack of data on, and unstandardized means to measure, adolescent offenders' social adjustment following their release from juvenile facilities, however, the effectiveness of the juvenile justice system *as a system* in deterring subsequent delinquency and criminality cannot be accurately evaluated.

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[124] Only 4 percent of the 215 juvenile facilities responding to Anno's 1984 survey mentioned above reported having had a lawsuit regarding the adequacy of health care filed against them in the preceding 5 years (15).

Some data are available on the effectiveness of *specific* interventions for treating adolescent delinquents and reducing recidivism, although measurement problems, such as unstandardized measures of recidivism, limit definitive conclusions. Interventions for treating delinquent adolescents tend to be either community-based or institutionally based.

Institutionally based treatment interventions for delinquent adolescents are those provided in institutional environments such as training schools. There is some limited evidence that behavioral approaches to treatment in institutions—for example, the use of point systems, token economies, and behavioral contracting (14,152,222), cognitive problem-solving and skill development (367), and family therapy interventions (32)—are more effective in reducing recidivism than nondirective peer group counseling (169) or traditional individual therapy interventions (152,173).

Community-based treatment interventions for delinquent adolescents include diversion programs that attempt to keep delinquent adolescents out of residential placements. The effectiveness of diversion programs may be overstated because of the inclusion of first-time offenders in the programs (343). Nonetheless, some programs with clearly defined and well-implemented interventions that incorporate behavioral and family-based change strategies have produced clear reductions in subsequent arrest rates (82), though not in self-reported delinquency behavior (83).

Another community-based treatment intervention that a well-designed study found to be effective in reducing delinquency was an intervention that involved integrating adolescents identified as antisocial with nondisturbed peers (132). Replication of the processes that may have produced these positive effects certainly seems warranted.

Other evidence of the effectiveness of community-based treatment interventions for delinquent adolescents comes from evaluations of family therapies (2,144,166,198,314). Two caveats are that several of the evaluations of these strategies failed to assess long-term impact on delinquency, and that these strategies are often plagued by high dropout rates (186).

Family group homes appear to reduce behavior problems during treatment, but these effects disappear after adolescents leave their group home (49,241). Wilderness programs in general have failed to show lasting effects (238,456), or document the relevance of these programs for the juveniles and their subsequent adjustment in their own communities. Similarly, restitution programs appear successful for some juvenile offenders in some circumstances (357), but questions remain about the conditions necessary for restitution to work. Lastly, a recent evaluation of programs found that recidivism rates of adolescents assigned to intensive probation programs were similar to those of institutionalized adolescent offenders (34).

The general lessons noted earlier in the summary related to the effectiveness of delinquency prevention programs pertain to treatment interventions as well. Overall, longer or more intensive community-based treatment interventions and/or treatment interventions that improve family functioning, incorporate some form of behavioral intervention, and modify delinquents' social networks seem the most promising, provided that they are appropriate to the juveniles' needs and strengths. Although institutionally based treatment may be necessary for some juvenile offenders, community-based treatment seems to be appropriate for many more youth than institutional treatment.

An example of how the best interests of adolescents are not well served in the juvenile justice system are the shortcomings in the provision of health care services to adolescents in custodial facilities. Existing studies suggest that health care services in juvenile correctional facilities are inadequate. The availability of health care is very important for adolescents in juvenile custodial facilities because many adolescents enter juvenile facilities with significant physical and mental health problems, and confinement in juvenile institutions increases the range of health problems they acquire. Health care standards for accreditation of custodial facilities do exist, but the standards are voluntary and only a very small percentage of custodial facilities are accredited. Another factor that appears to have a major impact on the lack of adequate care for adolescents in custodial juvenile facilities is the fiscal limitations in such institutions, for example, restrictions on Medicaid payment.

Major Federal Policies and Programs Pertaining to Adolescent Delinquency

Although juvenile justice is primarily a State and local issue, there has also been considerable involvement in juvenile justice issues by the legislative, executive, and the judicial branches of the Federal Government.

Legislative and Executive Branch Policies

From the early 1960s until 1974, the Federal Government's legislative and executive focus was on delinquency prevention and early intervention. In the early 1960s, a Presidential Committee on Youth Crime funded large-scale delinquency prevention programs in major urban areas, and later in the 1960s, a Presidential Commission on Law Enforcement and Administration of Justice recommended an emphasis on prevention, diversion, and deinstitutionalization. In 1968, Congress enacted legislation that called for grants to States and localities to improve juvenile justice and delinquency prevention programs to be administered by the U.S. Department of Health, Education, and Welfare [now the U.S. Department of Health and Human Services and the U.S. Department of Education]. That same year (1968), Congress also passed the Omnibus Crime Control and Safe Streets Acts that involved the U.S. Department of Justice in juvenile justice for the first time.

The 1974 Juvenile Justice and Delinquency Prevention Act (Public Law 93-415) represented a major step in enlarging the Federal Government's role in juvenile justice. After nearly 5 years of exhaustive investigations, the Subcommittee on Juvenile Delinquency of the U.S. Senate Judiciary Committee concluded that the existing juvenile justice system was failing miserably in several ways (401).[125] Congress responded by enacting the Juvenile Justice and Delinquency Prevention Act. That act established an Office of Juvenile Justice and Delinquency Prevention (OJJDP) in the U.S. Department of Justice[126] and a program of Federal grants to the States administered by OJJDP to provide technical assistance to help them come into compliance with the act's provisions. The 1974 act required States to remove status offenders and nonoffenders (e.g., abused and neglected youth) from secure confinement and to separate adult and juvenile offenders as a condition of receiving Federal funding. It also mandated new data collection and research efforts, including the dissemination of the findings of research and all data related to juvenile delinquency.

By 1978, the budget of OJJDP had increased to over $100 million per year from $14.5 million in 1975 (153). At that time, OJJDP played a major role in helping jurisdictions implement a 1980 amendment to a Juvenile Justice and Delinquency Prevention Act which required the complete removal of juveniles from jails and police lockups.

From 1981 to 1989, the focus of the Federal juvenile justice program on prevention, diversion, and assisting groups that litigated the rights of adolescent offenders shifted to concern over violent offenders, pornography, missing children, and school safety (333). Throughout this period, the Office of Management and Budget also proposed the elimination of funding for OJJDP.

For 8 consecutive years, Congress restored an appropriation for OJJDP over the objections of the U.S. Department of Justice and the Office of Management and Budget. Nonetheless, the total allocation to OJJDP decreased during this period and in 1989 was $66,692,000 (430). In 1990, although the President's budget recommended a large cut in funding for OJJDP, Congress appropriated $72,482,000. Virtually all of this amount is devoted to projects related to adolescents.[127]

In the last decade or so, the focus of most Federal initiatives within OJJDP has shifted from a delinquency prevention model to a criminal justice model emphasizing: 1) vigorous prosecution of serious juvenile offenders, 2) a new focus on the plight of missing children, 3) mandatory and harsher sentencing laws, 4) programs to reduce school violence, and 5) national crusades against drugs and pornography

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[125] Among other issues, the subcommittee hearings focused on the continuing problems of children held in jails, status offenders housed together with violent offenders, the lack of trained personnel, and inadequate prevention resources.

[126] Ch. 19, "The Role of Federal Agencies in Adolescent Health," in Vol. III, describes OJJDP's current major activities.

[127] For further discussion, see ch. 19, "The Role of Federal Agencies in Adolescent Health," in Vol. III.

(246,332). The wisdom of this approach has been questioned by many in the criminology field (246). OJJDP's priorities for fiscal year 1990 are serious juvenile delinquency, illegal drug use, youth groups (gangs), and missing and exploited children (430).

OJJDP's priorities appear to reflect a belief that the problems related to the prevention of delinquency are too large and intertwined with other social service elements for OJJDP to manage in light of its relatively small budget. OJJDP has suggested that other Federal agencies who have experience with adolescents could apply their efforts to delinquency prevention efforts before problems become juvenile justice issues.

Within the U.S. Department of Health and Human Services, several agencies are developing programs concerning adolescent involvement in delinquent activities. Among these agencies are the Centers for Disease Control in the Public Health Service and the Administration for Children, Youth, and Families in the Office of Human Development Services. The Injury Control Division of the Centers for Disease Control has mounted studies of violence, for example, that include adolescent violence. In fiscal year 1989, however, the Injury Control Division spent only $1.3 million on projects related to violence (355a).

Judicial Branch Policies

In the last 25 years, the U.S. Supreme Court has handed down a series of decisions related to juvenile court rules. One of these was the landmark decision *In re Gault* [387 U.S.1 (1967)]. In this decision, the Supreme Court specified a detailed set of rights that must be accorded juveniles. The Gault decision focused on notification of charges, protection against self-incrimination, the right to confront witnesses, and the right to have a written transcript of the proceedings. A more recent Supreme Court decision, *Schall* v. *Martin* [467 U.S. 243 (1984)], upheld the constitutionality of preventive detention of juveniles for their own protection and for the purpose of preventing pretrial crimes.

Whether juveniles in correctional facilities have a constitutional right to health care treatment is not resolved. As of the end of 1990, the U.S. Supreme Court has not ruled on that issue. Some lower Federal courts, however, have ruled on issues related to health care and treatment. Examples of rulings by lower Federal courts, include the following:

- An incarcerated child has the right to receive adequate treatment, including medical and mental health care, as well as the right to be free from brutal and oppressive conditions [*Inmates of Boys' Training School* v. *Affleck*, 346 F. Supp. 1354 (D. RJ. 1972); *Morales* v. *Turman*, 364 F. Supp. 166 (E.D. Tex. 1973); *Nelson* v. *Heyne*, 355 F. Supp. 451 (N.D. Ind. 1972), *aff'd*, 491 F. 2d 352 (7th Cir. 1974), *cert. denied*, 417 U.S. 976 (1974); *Gary H.* v. *Hegstrom*, No. 77-1039-BU (D. Or. Dec. 17, 1984); *Swansey* v. *Elrod*, 386 F. Supp. 1138 (N.D. Ill. 1975)].
- Juveniles must have sufficient medical staff and nursing staff to provide effective preventive and curative care for the health of all juveniles [*Morales* v. *Turman*, 388 F. Supp. 53 105 (E.D. Tex. 1974)].
- Juveniles should be free from the administration of psychotropic medication in an indiscriminate, unsupervised, unnecessary, or excessive manner [*Morales* v. *Turman*, 388 F. Supp. 53 105 (E.D. Tex. 1974)].
- An individual's constitutional right to treatment includes the right to individualized treatment for drug and alcohol dependency (79). (*Gary H.* v. *Hegstrom*, No. 77-1039-BU (D. Or. Dec. 17, 1984)].

Conclusions and Policy Implications

Consideration of adolescent delinquency in this country raises numerous issues important to public policy: How serious a problem is adolescent delinquency? Is it getting worse, or better? What causes adolescents to commit delinquent acts? Can delinquency be prevented? When delinquency occurs, what should the societal response be—punishment or treatment? As this chapter demonstrates, despite the longstanding national concern about delinquency among U.S. adolescents, the answers to these questions have not been resolved. The methodological limitations of available studies are partially responsible for the lack of definitive knowledge on delinquency, as are controversies regarding the definition and measurement of delinquency. Because of the ideological differences among observers, certain issues pertaining to adolescent delinquency are unlikely ever to be resolved definitively. Nonetheless, available information provides some direction for public policy decisions.

The number of U.S. adolescents who commit delinquent acts is one measure of adolescent delinquency. Available evidence indicates that most individuals in the United States admit committing some delinquent act during their adolescence. The precise number of adolescents who commit specific types of offenses is difficult to determine. According to National Youth Survey data from 1976, about 21 percent of adolescents commit at least one serious delinquent act (i.e., aggravated assault, forcible rape, and robbery) during adolescence, and about 5 percent report committing multiple serious offenses. On the positive side is evidence that most adolescents' engagement in delinquency—even serious delinquency—is of short duration. Evidence from the National Youth Survey is dated, however, and was obtained from adolescents who lived in an environment rather different from the current one.

The number of delinquent acts committed by U.S. adolescents in the aggregate is another measure of delinquency. Here again, however, the precise number is difficult to determine. One reason is that there are a number of different measures of delinquency; another reason is that the measures differ widely in their findings. Data indicative of the state of the problem are that in a single recent year (1987), there were 1.7 million arrests, approximately 1.4 million referrals to juvenile courts, and 700,000 admissions to custodial facilities among 10- to 17-year-olds.[128] In the aggregate, arrest rates for delinquent acts have declined in this country since the mid-1970s. However, arrest rates for aggravated assaults by U.S. adolescents have increased since the mid-1970s and arrest rates for murders by U.S. adolescents have risen in the past 4 years, suggesting that violence by adolescents is increasing.

Some limited self-report data confirm the rise in aggravated assaults, but more comprehensive data are needed to confirm or to contradict the trend in violence by adolescents. A periodic longitudinal survey of adolescents with questions about problem behaviors could yield information on adolescents involved in delinquent behavior and the number of delinquent acts committed by adolescents.

What causes adolescents to commit serious delinquent offenses? It is clear that not one but many risk factors contribute to an adolescent committing serious offenses. On the whole, however, the risk factors for delinquency are not completely understood.

Certain demographic characteristics—being in the age group 15 to 17, being male, being black, and having access to an urban area—are more associated with serious delinquency than others. The relationship of race to delinquency is unclear. When one examines self-reports of serious offenses, racial disparities are much smaller than those typically reported in arrest statistics. Furthermore, about half of black adolescents live in poor or near-poor families, many of them in urban areas typified by high rates of crime and limited educational or employment opportunities;[129] and adolescents of low income and adolescents who live in urban areas are more likely to commit serious delinquent acts than other adolescents.

Early socially disapproved behaviors, low IQ (particularly poor verbal ability), associating with delinquent peers, and family factors that include parental rejection and lack of parental supervision have been identified as factors increasing the risk of serious adolescent delinquency, and the importance of the association between them and adolescent delinquency has been definitively established. The vast literature on risk and protective factors provides strong clues on the factors in the social environment that can be modified, with the strong probability that much of delinquency can be prevented.

Although much is known about several factors associated with delinquency, there are several reasons why definitive information is not available about risk factors. First, most of the research that has been conducted to date has focused on individual constitutional factors and parental behaviors. Even among these factors, the importance of the relationship between many suspected risk factors, (e.g., biological factors) and delinquency is not known. Furthermore, most of the research on family factors has focused on parental behaviors in white families. There has been little investigation of parental behaviors in black and other minority families, and the relationship of family factors and the risk of adolescent delinquency in such families is uncertain.

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[128] It is important to note that these data represent arrests, referrals, and admissions, not individuals. Some individuals involved in the juvenile justice system may have more than one arrest, referral, and admission. Further, as noted earlier, some admissions to juvenile facilities are for reasons unrelated to delinquency.

[129] Risk factors confronted by many poor adolescents and adolescents in racial and ethnic minority groups are discussed in ch. 18, "Issues in the Delivery of Services to Selected Groups of Adolescents," in Vol. III.

Second, although it is clear that official rates of delinquency vary with the socioeconomic conditions of a community, few studies have investigated the processes by which the socioeconomic environment of the community affects the delinquency of individual adolescents. The economic and social environment of the community and perceived economic and social differences (for example, the perception that opportunity in mainstream society is blocked leading to devaluation of mainstream views) are likely to be associated with adolescent delinquency.

Third, although the same factors identified as risk factors characterize many adolescents who do not commit serious delinquent acts, the reasons why many children and adolescents are apparently "protected" from the adverse effects of certain risk factors have not been fully investigated.

Last, and perhaps most important, the interactions, including the temporal order, among all risk factors are not certain. More comprehensive models that include individual, familial, and community factors, including economic and social factors, are needed to explain and predict delinquency.

Despite incomplete knowledge about the causation of adolescent delinquency, some programs designed to prevent delinquency, while not widely duplicated or tested, have shown promising results in relatively rigorous studies. Overall, successful approaches to prevention can be characterized as those that have the following characteristics:

- they are appropriately supportive of children and adolescents and their families[130];
- they are intensive (i.e., they involve the commitment of considerable time, personnel, and effort); and
- they are broad-based (i.e., they intervene in a number of the systems—including family, school, and peer—in which the child and adolescent is involved, and use multiple services (e.g. educational, health, and social) as appropriate for the individual child and adolescent).

The most promising primary prevention efforts appear to be conducted early in life for high-risk children. These include the Perry Preschool Program and a broad-based prevention intervention that included parent-skill training. Promising secondary prevention approaches, conducted during adolescence after antisocial behavior has become apparent, include the intensive psychotherapeutic and vocational placement and remedial educational intervention evaluated by Shore and his colleagues and the integration of identified antisocial adolescents into activities with nondisturbed peers. These models deserve additional implementation accompanied by rigorous evaluation. Rigorous evaluations of future preventive interventions based on the knowledge about risk and preventive factors, and additional basic research on the causes of delinquency, are essential to advance knowledge in this field.

Also in need of attention as preventive factors are limits on access to guns and educational interventions intended to help adolescents avoid becoming victims.

The role of guns in adolescent delinquency has not been well researched, but it is clear that the use of guns can exacerbate the outcome of violent delinquent offenses by adolescents, as well as criminal acts by adults. The use of guns by adolescents to commit homicide and the use of guns by people of all ages to murder adolescents have increased in this country since 1976. Additional action may be needed to decrease U.S. adolescents' access to guns, given that existing Federal legislation already prohibits the sale of rifles and shotguns to individuals under the age of 18 and handguns to those under age 21. Limiting access to guns by adults also warrants consideration. The nature of these actions requires further investigation.

Victimization of adolescents is a problem that has received little attention, but adolescents, especially black adolescents, are more likely than Americans in other age groups to be victims of crimes, especially offenses committed by other adolescents. More precise data on adolescent victims is needed, along with approaches to preventing victimization that are broader than approaches that focus on perpetrators (e.g., educating adolescents to avoid victimization).

U.S. adolescents who commit offenses and are placed in juvenile facilities—perhaps 700,000 per year—may at first glance seem least deserving of society's attention. In fact, societal views of the relative merits of rehabilitative treatment and punishment change over time. Currently, many Federal and State governments appear to be taking a more punitive approach. The debate is difficult to resolve in the absence of definitive comparative evaluations, but existing evidence indicates that less punitive approaches (e.g., the use of open rather than closed facilities, community-based rather than institutionally based treatment efforts, rehabilitative treatment efforts rather than routine incarceration) are at least as effective as more punitive approaches for many adolescent offenders. Specific rehabilitative treatment interventions that show promise are similar to the most effective preventive approaches in being appropriately supportive of the adolescent and his or her family, intensive, and using multiple services and settings.

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[130] See ch. 3, "Parents and Families' Influence an Adolescent Health," in this volume for a discussion of models of appropriate parenting.

Three points about the U.S. juvenile justice system are very clear. First, black adolescents are more likely to be treated harshly by the juvenile justice system—i.e., more likely to be arrested, confined, and housed in secure correctional facilities—than are white, non-Hispanic adolescents. Hispanic adolescents are similarly more likely to be incarcerated than white non-Hispanic adolescents. The imbalance of minorities in the juvenile justice system is currently being examined by a number of national organizations at the request of the Federal Government, so any further governmental action on this issue should probably await the findings of these studies. Second, health care in juvenile justice facilities does not appear to meet the needs of adolescents in custody. Additional in-depth analyses of the causes and consequences of inadequate health care are needed before specific changes in policy are made; in the interim, the Federal Government could act now to make Medicaid available to incarcerated adolescents. Finally, the legislatively mandated role of OJJDP (the Office of Juvenile Justice and Delinquency Prevention) in delinquency prevention is precarious. The executive branch has requested elimination or a substantial decrease in appropriations for the office for many years and has reoriented the office's policy with regard to juvenile justice away from basic research and delinquency prevention to serious and violent offenders and other issues. Perhaps it is time for a reexamination, perhaps by an objective, expert group, of the role of OJJDP vis a vis that of other Federal agencies involved in the prevention and treatment of delinquency.

Chapter 13 References

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Chapter 14

HOMELESSNESS: PREVENTION AND SERVICES

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Chapter 14

HOMELESSNESS: PREVENTION AND SERVICES

Introduction

The traditional stereotype of the homeless person —that of the white, older, skid-row alcoholic—no longer describes the "typical" homeless person. During the last 10 to 15 years, the characteristics of the homeless have changed. Today, the homeless are younger, include a larger portion of women, and include more people who suffer from mental disorders (59). Perhaps the most alarming change in the homeless population in recent years has been the dramatic rise in the numbers of homeless families with children.

This chapter focuses on the problems and service needs of homeless adolescents and on the services available to address the needs of these individuals. First, it discusses the causes of homelessness for adolescents and the problems and service needs of homeless adolescents. Then it presents information on Federal programs and the recent legislative history of congressional efforts to address the homelessness crisis. The chapter ends with a discussion of conclusions and policy implications pertaining to homelessness among adolescents.

Nobody really knows how many children and adolescents are homeless, either living in homeless families or on their own. The U.S. Department of Health and Human Services (DHHS) estimated in 1984 (on the basis of 1976 data) that there are as many as 1 million homeless and runaway[1] adolescents each year (71), and in the absence of more recent national data, this estimate continues to be used (71). Efforts were made by the U.S. Bureau of the Census to count homeless people in the 1990 census, but even those efforts are unlikely to result in an accurate count of the number of homeless and runaway adolescents.

Background on Homelessness Among Adolescents

As suggested above, some adolescents become homeless with their families and others become homeless on their own. The etiology of homelessness among these two groups of adolescents and the service needs of adolescents in the two groups are somewhat different.

Photo credit: Sasha Bruce Youthworks Inc.

Homeless adolescents can be homeless on their own or with their families. Children in some States may be removed from families that are homeless on the grounds of abuse or neglect, because being unable to provide a home may be perceived to be evidence of neglect.

Causes of Homelessness Among Adolescents

Homelessness for Adolescents in Families

Adolescents who become homeless with their families become homeless because of situations that

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[1] As discussed below, definitions used for "runaway" and "homeless" adolescents vary. Generally, homelessness denotes a long-term situation, while "runaway" is used to characterize those adolescents who have left home overnight without permission. In fact, the population is a dynamic one. In addition, both runaway and homeless populations include adolescents who have been asked or ordered to leave home and have nowhere else to live (so-called "throwaways" or "thrownaways.")

Photo credit: Office of Technology Assessment

The decreasing availability of safe, affordable, accessible low-income housing in this country is believed to have contributed substantially to the increase in the numbers of homeless families.

affect their family as a whole. Various events can precipitate homelessness for families, just as they can for individuals or couples.

Broad social and economic developments leading to homelessness include inflation and unemployment coupled with reductions in funding of social and human service programs (59). Furthermore, the availability of low-income housing has generally decreased as a consequence of factors such as gentrification of inner cities (77).[2] The specific incidents precipitating homelessness for a family are as varied as eviction from housing, estrangement from family members, criminal victimization, illness, loss of employment, and disaster (e.g., fire).

Once an adolescent's family becomes homeless, shelter rules and restrictions may result in the adolescent's separation from his or her family. Some communities lack family shelters, and as a result, families may have to separate in order to receive shelter. Another problem that arises is that some shelters do not allow adolescent males to enter with their mothers (15,66).

Young adolescents whose families are homeless may sometimes be placed in foster care.[3] In some cases, the placement of a child from a homeless family in foster care is the parent's choice, and in others it is the result of the intervention of child welfare authorities. A parent may choose to place children in foster care temporarily, believing that the children will be better provided for in foster care while the parent gets back on his or her feet. Guidelines recently developed by the National Association of Public Child Welfare Administrators discourage child welfare intervention in cases where, in the absence of other apparent abuse or neglect, parents are unable to support their children adequately despite the use of all available resources, such as in the case of homelessness (76). The States of California, Texas, and Maryland all prohibit child welfare intervention on the basis of homelessness alone (76). Still, children in some States may be removed from families that are homeless on the grounds of abuse or neglect—because being unable to provide a home may be perceived to be evidence of neglect. In New Jersey in 1986, 18 percent of the children in foster care (ages not specified) were in foster homes because their families could not find a place to live (24). Homelessness was the primary or secondary reason for foster care placement for 40 percent of the children in foster care in New Jersey.

The removal of children from the custody of their parent or parents may result in the loss of eligibility for welfare benefits under Aid to Families With Dependent Children (AFDC),[4] further reducing the parents' ability to secure housing. Furthermore, the parents may not be allowed to regain custody of the children until they demonstrate that they have obtained adequate housing. Thus, it may be extremely difficult for a parent to regain custody of a child who has been placed in foster care, even in cases where there has been no evidence of parental abuse or neglect. Visits to see children also become difficult for parents who are moving from shelter to shelter, and the reduced contact between parents and children may further erode family relationships (76).

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[2] *Gentrification* refers to the "back to the city" movement by middle- and upper-class suburbanites that began in the 1970s. This has resulted in the conversion of many low-income dwellings to more expensive housing (e.g., condominiums) no longer affordable to their former tenants. A particularly harmful cost of this movement for the poor has been the dramatic decrease in single-room occupancy hotel rooms; nearly half of the Nation's total stock has disappeared since the early 1970s (27).

[3] For more information about foster care, see ch. 3, "Parents and Families' Influence on Adolescent Health," in this volume.

[4] The AFDC program is a program established under the Social Security Act that provides cash welfare payments to families with dependent children who have been deprived of parental support or care as a result of the death, incapacitation, unemployment, or continued absence of a parent and who meet income and resource criteria specified by the State. It is administered by the Family Support Administration of DHHS.

Recently, Title V, Subtitle B, Section 553 (Assistance To Promote Family Unification) of the Cranston-Gonzalez National Affordable Housing Act of 1990 (Public Law 101-625) authorized an additional $35 million for each of fiscal years 1991 and 1992 to provide housing assistance for certain families in order to avert childrens' homelessness and subsequent placement in foster care. The families affected by this provision of Public Law 101-625 would be those: 1) who are eligible for assistance under Section 8 of the United States Housing Act of 1937 and 2) whom the public child welfare agency for a jurisdiction has certified is a family for whom the lack of adequate housing is a primary factor in the imminent placement of the family's child or children in out-of-home care or the delayed discharge of a child or children to the family from out-of-home care. Allocations from the fund are to be made on the basis of a jurisdiction's demonstrated need.

Homelessness for Adolescents on Their Own

Definitions used for "runaway" and "homeless" adolescents vary. The National Network of Runaway and Youth Services differentiates among the following categories: 1) *runaways*, young people who are away from home at least overnight without the permission of a parent or caretaker; 2) *homeless youth*, youth who have no parental, substitute foster, or institutional home and who in some cases may have left (or been urged to leave) with the full knowledge or approval of a legal guardian; and 3) *street kids*, long-term runaway or homeless youth who have become adept at fending for themselves "on the street," usually by illegal activities (41).[5]

Homeless adolescents and street kids who have been forced out of their homes when they are no longer wanted by their families are sometimes called "throwaways," "thrownaways," or "pushouts." A recent report by the U.S. Department of Justice differentiated between: 1) *runaways*, children who leave home without permission and stay away overnight; and 2) *thrownaways*, children who have been told to leave the household, children who have been abandoned or deserted, and children who run away and whose caretaker does not allow them to return, makes no effort to recover them, or does not care whether they return (74).

In fact, the population of homeless and runaway adolescents is a dynamic one, with at least some homeless adolescents having histories of being runaways and at least some runaway adolescents being just a step away from being more permanently homeless themselves. As a practical matter, therefore, the distinctions between homeless adolescents on their own and runaway adolescents are sometimes arbitrary. Furthermore, both groups are served through the same service system—namely, runaway and homeless youth centers, many of which are funded in part by the Federal Government.[6] Much of the information in this chapter on homeless adolescents on their own has been gathered from adolescents using runaway and homeless youth centers. Unless otherwise specified, when data on homeless adolescents are reported, this chapter does not make distinctions between adolescents who might be identified as runaways and those who are truly homeless and living on their own.

Adolescents become runaways or homeless on their own for many reasons. Very few report leaving home to have fun or to travel (33,71). Adolescents frequently run away from dysfunctional and abusive families (43,54,57,58,72,74).[7] Evidence suggests that the majority of these homeless adolescents have histories of being physically or sexually abused (31,33,42,57). Not surprisingly, conflict with family members is often cited as a primary reason for leaving home (2,66,72). Nearly two-thirds of the young people seen at federally funded runaway and homeless youth shelters cite a conflict with parents as their main reason for leaving home (30,66). For some homosexual or bisexual adolescents, family conflicts over their sexual orientation precipitate their running away (33,56). High rates of parental alcohol abuse have also been reported for families of homeless adolescents on their own, contributing to family violence and conflict (47,51,57). Most runaways and homeless adolescents on their own come from single-parent or "reconstituted" families (43).[8] A study of 536 homeless and runaway adolescents in New Jersey found that only 14 percent had left homes where both their biological parents resided (58).

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[5] Although the term "youth" is commonly used when discussing adolescent homelessness, OTA prefers the term "adolescent." The term youth implies a broader undefined age range than the term adolescent and may include children younger than adolescents ages 10 through 18, as well as young adults. In this chapter, OTA uses the term adolescent except in those cases where youth is part of the actual name of a piece of legislation (e.g., Homeless and Runaway Youth Act), the actual name of a service organization or provider (e.g., homeless and runaway youth centers), or part of a definition provided by an organization or in legislation to describe a particular population (e.g., the definition of homeless youth provided by the National Network of Runaway and Youth Services).

[6] Federally funded runaway and homeless youth centers are locally controlled facilities that receive Federal funds under the Federal Runaway and Homeless Act to provide emergency shelter and other services to runaway or otherwise homeless youth.

[7] For further discussion of dysfunctional families, see ch. 3, "Parents and Families' Influence on Adolescent Health," in this volume.

In a sample of 118 adolescents entering runaway shelters during a 2-week period in New York City, Shaffer and Caton reported that unaccompanied homeless adolescents tend to have parents who are not homeless (57). It will be interesting to see if the number of unaccompanied homeless adolescents with homeless parents increases as the number of homeless families in general rises.

Adolescents leaving foster care or institutional settings (e.g., State psychiatric hospitals or juvenile justice facilities) may become homeless if proper discharge planning, including followup, is not performed, or if adolescents are placed in out-of-home settings that are inappropriate to their needs (1,39, 59,76). Adolescents leaving foster care or mental health institutions may have no place to live after they are no longer eligible for these residentially based services (15,39,59). About 10 percent of adolescents receiving ongoing services from runaway and homeless youth centers had spent most of the time during the previous year in an institutional setting (72).

In their study of adolescents entering runaway shelters in New York City, Shaffer and Caton found that half of 118 young people interviewed in shelters serving runaway and homeless adolescents had spent some time in foster care; a fifth had most recently lived in an institutional setting (57). Those with a history of foster care placement had more transient residential histories in general than adolescents who had not been in the foster care system.

In a study of 93 homeless adolescents in various settings in the Hollywood, California area (e.g., shelters, soup kitchens, and informal congregate sites such as street corners), Robertson found that substantial percentages of homeless adolescents had been in various institutional settings previously—including foster care (40.9 percent), group homes (38.2 percent), and juvenile detention or jail (55.9 percent) (47). About a third of these adolescents, Robertson found, had gone to a shelter or the streets after their most recent separation from an institutional setting. Many of these adolescents (all of whom were ages 12 to 17) had simply run away from their last placement; others had been discharged to the custody of their parents, but returned to the streets after a fight or by mutual agreement (48).

Another recent study of young adults who had been out of foster care for at least 2 years also reported that one-third had spent their first night after discharge on the streets; 29 percent had experienced periods of homelessness since leaving the system at age 18 (76).

Service Needs of Homeless Adolescents

Homeless adolescents have a wide range of service needs. The problems and service needs of homeless adolescents living with their families differ in some ways from the problems and needs of adolescents homeless on their own.

Homeless Adolescents in Families

How Many of the Homeless Are Families With Children?—Most of what is known about homeless adolescents in families has come from surveys of families in shelters. Virtually nothing is known about homeless families who survive living in vacant buildings, their cars, or temporarily "doubled up" with friends or relatives.[9] Cities surveyed by the U.S. Conference of Mayors in 1987 reported that an average of one-third of their homeless populations were families with children. Some cities surveyed (e.g., New York) reported that homeless families with children made up nearly two-thirds of their homeless population (63). The vast majority (over 70 percent) of the cities surveyed reported that homeless families were the largest group for whom emergency shelter and other needed services were most lacking.

There is a broad consensus that the numbers of homeless families are growing, and that children (including adolescents) may be the fastest growing group of homeless people. The U.S. Conference of Mayors, in its 1986 survey of 25 cities, reported that the most significant change in the homeless population during 1986 was the growing number of families with children; 80 percent of the cities surveyed reported an increase in the number of homeless families with children (62). The 1987 survey of cities by the U.S. Conference of Mayors reported that the numbers of homeless families and children were continuing to increase (64). On average, the number of homeless families with children had increased by one-third during the previous year (Charleston, South Carolina, reported an increase of 144 percent). It must be noted, however, that these figures do not reflect actual counts by the U.S. Bureau of the Census. During the 1990 census, new efforts were made to include homeless persons in the census count by surveying shelters and observing individuals in places where homeless people tend to congregate (e.g., under bridges, in parks). The findings based on this one-night count may provide some important information on the numbers of homeless families (and adolescents). Given the many methodological problems involved in counting homeless persons and the many "hidden" homeless who may not be observed by census interviewers, however, it is unlikely that the 1990 effort will produce a truly accurate assessment of the numbers of homeless families with adolescents.[10]

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[8] "Reconstituted" families are typically those in which a child lives with two adults who function as the child's parents, only one of whom is a biological parent (e.g., stepfamilies).

[9] The U.S. General Accounting Office estimated that 186,000 children and adolescents lived in "shared housing" at any given time during 1987 (65).

How Many Homeless Families Include Adolescents?—Data on the numbers of homeless adolescents ages 10 to 18 who are living with their families are not available. Estimates of the numbers of homeless children in families vary. Available literature, which is based exclusively on studies of families staying in shelters, suggests that homeless families typically consist of women on their own (usually single) with their young children—usually under the age of 5 (7,8,9,10,25,37,63). To OTA's knowledge, there are no studies that look exclusively at adolescents living with their families in shelters. There are studies that *include* adolescents ages 10 to 18, but these studies do not examine adolescents separately. The story of one adolescent who lived with his family in a homeless shelter is recounted in box 14-A.

A 1989 U.S. General Accounting Office (GAO) report estimated that, on any given night, there are 68,000 children and adolescents age 16 and under who are members of homeless families (65). Of those 68,000, an estimated 12 percent (8,160 adolescents) are ages 13 through 16 and an estimated 36 percent (24,480 children and adolescents) are ages 6 through 12.

Other studies, although using somewhat different age breakdowns, have found results roughly consistent with the GAO study. Two studies reporting age breakdowns of children living with their families in shelters found that fewer than 10 percent of one study sample were ages 12 to 16 (8), and that 26.6 percent of another sample of sheltered children were ages 11 to 17 (37). A study of homeless adolescents using meal programs in Alameda County, California found that 17 percent of children in recently homeless families were ages 13 to 17 (50). Differences in the percentages of children who are adolescents in any given shelter probably depend on a number of factors, including shelter regulations that restrict the sheltering of older children and the composition of the local homeless population.

Service Needs of Homeless Adolescents in Families—The limited research that has been conducted on children (including adolescents) who are homeless in families indicates that these children experience a broad range of problems, including physical and mental health problems and school problems (3,39,41a). Some of these problems and the service needs of these children are discussed below.[11]

Physical Health—Studies indicate that homeless children are at higher risk for virtually all medical disorders experienced by children in general (37,39, 41a,77). They are particularly vulnerable to ailments that result from environmental exposure and unsanitary living conditions, including problems such as upper respiratory and ear infections, gastrointestinal problems, lice infestations, burns and trauma (37,41a, 77). They also experience high rates of dental problems.[12] Data from the 19 Health Care for the Homeless projects funded by the Robert Wood

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[10] In the Stewart B. McKinney Homeless Assistance Amendments Act of 1990 (Public Law 101-645, sec. 402), Congress requested the U.S. Government Accounting Office to study the methodology and procedures used by the Bureau of the Census in their count of homeless people.

[11] Here and in the remainder of the discussion that follows, the term "children" is used to refer to children up to the age of 18 unless otherwise specified. Data sources generally do not break out adolescents ages 10 to 18; consequently, it is often not possible to describe their needs specifically.

[12] For a general discussion of dental problems experienced by low-income adolescents, see ch. 8, "Dental and Oral Health Problems: Prevention and Services," in this volume.

Box 14-A—A 13-Year-Old's Recollection of Life in a Homeless Shelter

My mother and my four brothers and sisters and I spent $2^1/_2$ years in the shelter. We moved there when I was 11 because my mother wanted to keep the family together, and not send us all to separate foster homes. Our old one room house that we were renting was condemned. It shouldn't have been lived in or rented; it had a cracked window that kept it cold during the winter. My little brother caught pneumonia and was in the hospital for 2 months and almost died. Our social worker said that we must move out and go to a shelter, or she would put us all in a foster home—my mother did not want to separate us, so we decided to move to a shelter.

Life in the shelter was very hard to get used to. When we first got there, we had to stand in line outside in the cold to eat. We couldn't have visitors; not even relatives could come to the room to see us. There were times when there were mice and rats in our room. Sometimes we didn't have any heat and in the summer you couldn't open the windows to get air when the air conditioners broke down. I had to get up really early, because I had to take three buses so I could get to school. At school some of the kids would make fun of me about living in the shelter, but I would just ignore them. The food at the shelter tasted like plastic or paper cardboard. We saw the cooks stealing food that we were supposed to eat. People were getting sick from the food that we got at the cafeteria. There were no doctors to look after those who were sick. People were breaking into rooms when no one was in them. There were security guards there, but they were often as afraid as we were. One security guard shot himself. Drugs started to take over some of the people, and they would blame their children outside why they were doing drugs. I once saw some people come and throw a man off a balcony, because he owed them money. There was a lot of shooting and even children dying. One man who was shooting someone at the shelter almost hit a baby.

Soon after all of this stuff we got a doctor to come and be on the property, we got new guards to work there, and even the food got better. They made it so that the people ate food by sections so there wouldn't be too long of a line to stand in. People started to come and go when they wanted so that they didn't feel like prisoners. We could even have visitors. My mother got a chance to get a trade as a carpenter. She and some other parents started a children's watch so that all of the children would be in their rooms at a certain time. The best part of the shelter was that there were always kids to play with. Only families were allowed to stay at the shelter. A photographer came to the shelter to teach photography and my mom said it would be a good idea to go, even though I didn't really want to. Now I take lots of pictures, and some have even been published in *Life Magazine* and *The Washington Post*.

There were people who only stayed in the shelter for a little while, but some stay forever. Luckily we finally got out and now we live in our own home and we are doing very well. Thanks to the shelter we had some place to go and we were all able to stay together as a family.

Johnson Foundation and the Pew Memorial Trust (39) indicate that children who are homeless experience chronic health problems at about twice the rate reported in the National Ambulatory Medical Care Survey[13] for children in general (77). Inadequate facilities for daily hygiene increase risk of disease and make it nearly impossible to follow prescribed medical regimens. Living in close quarters, particularly in communal shelters, can increase the risk of disease transmission (26).

Children who are homeless have been found to experience nutritional deficits, such as iron deficiencies (39), and visual problems (41a).[14] Shelters and other emergency food assistance facilities report that they are often unable to provide nutritionally balanced meals to residents and that they view lack of food and poor nutrition as serious problems for homeless families (63).

Mental Health—Information about the mental health of older children in shelters with their families is extremely limited. However, in studies of the children of homeless families in Boston, Massachusetts, researchers found that children had serious developmental and emotional problems (7,8,9,10). These studies assessed school-aged children living in shelters in Boston—of whom about one-third were ages 12 to 16 and two-thirds were ages 6 to 11—on the Children's Depression Inventory and the Children's Manifest Anxiety Scale and found that they manifested high degrees of distress. Despite their methodological limitations, the studies in Boston do substantiate the generally high levels of distress that children living in shelters can experience (9). Many of the difficulties experienced by the Boston children (e.g., poverty, residential instability), however, predated their current episode of homelessness, indicating that the lives of these children may have been disrupted for some time (9). In contrast, a Philadelphia study of 43 shelter children ages 6 to 12 found that only 9 percent had scores in "the clinical range" on an index of emotional and behavioral problems; another 7 children ages 6 to 12 (16 percent) in this study had scores near the clinical range (41a). These findings could have been a result of having parents rather than children or professionals assess the children's state of psychological health (41a). In general, the researchers in this study seemed surprised at parents' favorable ratings of their children's health. When the researchers used projective measures of emotional status, such as making three wishes and house-tree-person drawings, the 6- to 12-year-olds showed "a strong tendency to wish for major changes in their life situation, indicating an intense awareness of their plight as homeless poor people" (41a). In contrast, younger children seemed less aware of their and their families' plight (41a).

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[13] The National Ambulatory Medical Care Survey is an ongoing survey conducted by DHHS of ambulatory visits to office-based physicians. See ch. 6, "Chronic Physical Illnesses: Prevention and Services," in this volume, for additional information about the survey.

[14] For a general discussion of the nutritional problems of adolescents, see ch. 7, "Nutrition and Fitness Problems: Prevention and Services," in this volume.

The experience of homelessness puts families as a whole under high levels of stress, and children in families that are homeless may be at greater risk of child abuse and neglect than similar domiciled children. In one Boston court, homeless children account for one-third of the abuse or neglect cases (22).

Access to Health Care—Children who are homeless are frequently without adequate or any health insurance coverage.[15] A Washington State study found that 35 percent of a sample of homeless children had no insurance coverage; 40 percent were covered by Medicaid. One-third of the homeless children in this study did not have a usual site of health care (e.g., public clinic, hospital clinic, or emergency room), and over half (58.9 percent) did not have a usual health provider (e.g., doctor, nurse, or nurse practitioner). Lack of money or insurance coverage of dental care frequently prevented families from seeking this care when it was needed for children. Rates of emergency room use by children who are homeless have been reported to be much higher than for children in general, either because care for homeless children is not sought until problems become acute or because such children have no regular health provider (37,41a).[16]

Education—The U.S. Department of Education, in a recent report to Congress on school-aged homeless children and adolescents, estimated that there are 272,773 school-aged homeless children throughout the United States (70).[17] Estimates were made using a variety of methods, including actual 1-day counts, data based on estimation, and partial data where information was not available for all parts of a State. One State, Hawaii, did not provide data for the report. Because of these methodological concerns, caution is advised when interpreting the data.[18]

About three-quarters (about 72 percent) of school-aged homeless children and adolescents are estimated by the U.S. Department of Education to be attending school; more than one-quarter (about 28 percent) of school-aged homeless children and adolescents are not thought to be attending school.[19] The U.S. Department of Education reports that about 47 percent of homeless school-aged children and adolescents who are attending school are in grades 7 through 12 (26 percent in grades 10 through 12 and

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[15] For a general discussion of health insurance coverage among adolescents, see ch. 16, "Financial Access to Health Services," in Vol. III.

[16] For a discussion of issues pertaining to the delivery of care to adolescents, see ch. 15, "Major Issues Pertaining to the Delivery of Primary and Comprehensive Health Services to Adolescents," in Vol. III.

[17] Estimates include figures for the Virgin Islands, American Samoa, and Puerto Rico. These territories account for an estimated 3,000 homeless school-aged children and adolescents.

[18] This study was submitted to Congress in response to section 724(b)(2) of the Stewart B. McKinney Homeless Assistance Act (Public Law 100-77). Recent amendments to the act (the Stewart B. McKinney Homeless Assistance Amendments Act of 1990—Public Law 101-645) require an additional study by the U.S. Department of Education to "determine the best means of identifying, locating, and counting homeless children and youth"..."to create as accurate an account as possible of the number, location, and living circumstances of such children and youth that are attending school regularly, part-time, or not at all, and reasons for the non-attendance of such children and youth."

[19] Data were not provided to the U.S. Department of Education by Alabama, the District of Columbia, Louisiana, Mississippi, New York, or the Virgin Islands.

21 percent in grades 7 through 9), and about 49 percent in kindergarten through grade 6 (70).[20]

New York City data reveal that about two-thirds (64 percent) of homeless junior-high-school-aged adolescents and half of homeless high-school-aged adolescents in the city attend school (44,45).

The National Coalition for the Homeless estimates that 40 percent of homeless school-aged children do not attend school (40).

Bassuk and her colleagues report that by the time they reach the shelter, children have frequently already experienced problems in school (9,10). For example, 43 percent of homeless school-aged children in a Boston study were found to have repeated a grade by the time they were surveyed in the shelter. Not surprisingly, the study of 6- to 12-year-old children in Philadelphia shelters found that the children tended to have low scores on standardized tests of expressive vocabulary and word decoding (41a).

Homeless children face a number of barriers to continuing their schooling (45). Because shelters rarely have day-care facilities, older children will often stay out of school to care for younger children while parents are out job hunting or looking for housing (11). Similarly, school-aged parents may be prevented from attending school (70). Even if they had been attending school regularly prior to entering the shelter, adolescents are frequently unable to continue to attend their "home" school, as the shelter is rarely in the same area. Until Federal laws were changed recently with the Stewart B. McKinney Act (discussed below), homeless children were often refused enrollment in schools because they lacked a permanent address (23); even with the change in law, resistance from school personnel continues in some areas (55).

Lack of appropriate documents, such as birth certificates and immunization records, may also make it difficult for homeless families to register children for school (63,70). Families moving from place to place may find it particularly difficult to keep important personal records securely with them. Without transportation, they find it extremely difficult to file requests for copies of birth certificates personally, and by the time copies have come through mail requests, families may have relocated. Significant delays can also be experienced when records are transferred from schools where children were previously enrolled (70). If children are living separately from their parents (e.g., with friends or family), the unavailability of a legal guardian can prevent school registration (40).[21]

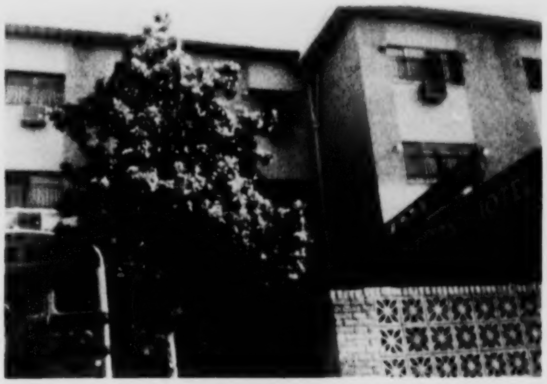

Photo credit: Office of Technology Assessment

Recent changes in Federal law prohibiting exclusion of children from school because they have no permanent address, and special schools and programs for homeless children in difficulty in school, are ways in which policymakers and educators are addressing the educational needs of homeless children in families.

Even when they are enrolled in school, homeless children face barriers to school attendance. Attendance at a child's "old" school may require long daily trips on public transportation; and money is not always available to pay for transportation (40,70). Many homeless children find that they must face ridicule from their classmates when it is discovered that they are homeless (23,55). Another problem is that homeless shelters are often lacking in the privacy and quiet needed for children to complete their homework (40). Educators who work with homeless children indicate that it often takes special effort to keep homeless children in school, even knocking on shelter doors every day to ensure attendance (55).

One response to this problem has been to create special schools for homeless children where they will not be ostracized and educators understand their needs (23). Special schools for homeless children have been created in Tacoma, Washington; Santa Clara, California; and Salt Lake City, Utah (23). Homeless children and adolescents often have special educational needs that include remediation in basic skills, support services such as counselors and social workers, after-school programs to address basic needs including food and shelter, and sensitivity and awareness training for school personnel (70).

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[20] Data on grade level were not available for 4 percent of children and adolescents.

[21] Title VI of the 1990 amendments to the McKinney Act (Public Law 101-645) addresses these barriers to school enrollment (discussed below).

Homeless Adolescents on Their Own

Recent concern about homeless children has focused primarily on the needs of children who are part of homeless families. As noted earlier, however, many, if not most, homeless adolescents are living on their own. In many ways, the problems of homeless adolescents on their own raise more difficult policy issues.

How Many Adolescents Are Homeless on Their Own?—Estimates of the number of unaccompanied homeless adolescents ages 10 to 18 vary. Among the cities surveyed by the U.S. Conference of Mayors in 1987, 12 cities reported on numbers of unaccompanied homeless adolescents. These cities reported that unaccompanied adolescents (ages not specified) represented 4 percent of their homeless population (64). Nine of twelve cities reporting on the numbers of unaccompanied homeless adolescents reported that homeless adolescents were a group that was increasing in size.

Title V of the Stewart B. McKinney Homeless Assistance Act of 1987 provided funding for the Primary Health Care and Substance Abuse Program (the Health Care for the Homeless Program) by adding a new Section 340 to the Public Health Service Act (34). The federally funded Health Care for the Homeless Program provides direct health care services to homeless persons and is administered by the Bureau of Health Care Delivery and Assistance within DHHS. In 1988, during the first year of operation of the program, 1.8 percent of the contacts were with runaway or homeless adolescents (ages not specified) (34).

DHHS, in the 1984 annual report on runaway youth centers, estimated that about one-third (or 100,000) of the young people receiving services under the Runaway and Homeless Youth Act (discussed below) were homeless (71). DHHS further estimated in 1984 that there are more than a million runaway and homeless adolescents ages 10 to 17 each year (72). Because of the lack of more recent national data, these estimates, based upon a 1976 National Statistical Survey of Runaway Youth mandated by Congress in the original Runaway Youth Act (Public Law 93-415), continue to be used (72).

Photo credit: Sasha Bruce Youthworks, Inc.

In many ways, the problems of homeless adolescents on their own raise more difficult policy issues than do the problems of homeless children with their families.

In a 1990 study sponsored by the Office of Juvenile Justice and Delinquency Prevention of the U.S. Department of Justice[22] to determine the numbers of children who are missing each year, researchers used a variety of methods to develop estimates—including a national telephone survey of over 10,000 randomly selected households to develop estimates of the numbers of children who had run away, been thrown away, been abducted, been lost, or were otherwise missing; a survey of juvenile facilities (e.g., group foster homes, juvenile correctional facilities, mental health facilities, and drug abuse rehabilitation facilities) to determine the number of runaways from these facilities; an interview study with children who had run away and returned home; and a study of a national sample of agencies having contact with children to determine the numbers of children known to these agencies who had been abandoned or thrown away.

According to the U.S. Department of Justice study:

- There are approximately 450,700 children and adolescents who run away in the United States each year; and about 133,500 of them are without a place to sleep during some night while they are away from home (75).

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[22] This study was mandated by the 1984 Missing Children's Assistance Act (Public Law 98-443, sec. 404 (b)(3)) (75).

- There are approximately 127,100 "thrownaway" children and adolescents in the United States each year; and about 59,200 of them are without a familiar and secure place to stay at some point during their thrownaway experience (75).
- About 45,900 children and adolescents in the United States in 1988 qualified as both runaways and thrownaways (75).[23]

All of these estimates include high proportions of adolescents. The U.S. Department of Justice study found that nearly all of the estimated 112,600 "thrownaways" who were identified through the household survey were ages 13 to 17; about one-quarter of the estimated 14,500 "abandoned" children identified through a community survey of child-serving agencies were ages 11 to 17; and 98 percent of the estimated 446,700 "runaways" identified through the household study were ages 11 to 17 (75). The researchers consider these estimates of the numbers of throwaways and abandoned adolescents and children to be conservative because they rely on interviews with caretakers (who might be more likely than their children to report an incident as running away rather than being thrown away) and because estimates of the numbers of abandoned children relied on limited data from providers (75).

The U.S. Department of Justice study, on the basis of the household survey only—i.e., excluding estimates of the numbers of abandoned children and adolescents and the numbers of runaways from juvenile facilities[24]—estimated that 513,400 children and adolescents become runaways or thrownaways in the United States each year (75).[25] One cannot determine from the data how many of these 513,400 children and adolescents could be classified as homeless during their runaway or thrownaway experience. The data clearly indicate, though, that tens of thousands of adolescents in the United States each year have the experience of being without a familiar and secure place to sleep.

In fiscal year 1987, 10.1 percent of the 56,000 adolescents who received shelter or counseling through federally funded runaway and homeless youth centers were classified as homeless (72). That year, however, only about half of the adolescents who received such services at these centers were reunited with their families, a fact which suggests that the percentage of adolescents who are homeless may be much higher. Of the adolescents receiving services, 35.2 percent were placed in alternative living arrangements, 9.2 percent had no planned destination, and 5.4 percent returned to the streets. In general, younger and runaway adolescents tended to return home; older and homeless adolescents tended to pursue alternate arrangements. GAO estimates that 70,000 unaccompanied young people may have been served by federally funded and other runaway shelters in 1987; there may be another 64,000 to 208,000 homeless adolescents who are not seen in shelters (65).

A study of adolescents using shelters in Los Angeles County reported that 35 percent had no home to which they could return; another quarter were chronic runaways who were unlikely to be returned home (35). Two-thirds of the adolescents seen by outreach agencies (e.g., drop-in centers or street workers) were truly homeless; most were staying on the street.

There is little information available about homeless adolescents on their own who do *not* use available shelter and runaway services (i.e., adolescents who stay, for example, in cars, abandoned buildings, parks, or all-night restaurants).[26] Homeless adolescents living on their own who do use the runaway and homeless youth shelter system, however, tend to be non-Hispanic white (although blacks represent a disproportionate share), ages 16 or 17 (generally older than homeless adolescents with their families), and are more likely to be male than female (55 percent of homeless adolescents using runaway and homeless youth shelters are male) (66). The ethnic mix of adolescents who use the runaway and homeless youth shelter system, however, tends to vary depending on the greater community. In their sample of adolescents entering runaway shelters during a 2-week period in New York City, for example, Shaffer and Caton reported that about half were black and more than one-third were Hispanic (57). The numbers of male adolescents from Central America who have entered the country illegally and are now homeless may be increasing (43).

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[23] Individuals could qualify as both, for example, if they had had more than one incident of leaving home, or if, after running away, they had become thrownaways when their caretaker refused to allow their return home.

[24] The authors of the study caution against simply adding together estimates of the numbers of different types of "missing" children (e.g., runaways with thrownaways) because of the potential for overlap between categories, and because it may not make conceptual sense to combine categories (75).

[25] Because of the high proportion of adolescents identified as runaways or thrownaways in the household survey, one would expect a very high proportion of these 513,000 runaways/thrownaways to be adolescents.

[26] The proportion of unaccompanied homeless adolescents who use shelter services is unknown. One study, which sampled homeless adolescents from a variety of sites other than shelters in Hollywood, California, found that only 40 percent reported that they had stayed in a shelter during the previous month (52).

According to data collected from runaway and homeless youth centers, most homeless adolescents using runaway and homeless youth centers are from the local area (49,66,72). DHHS reported in 1987 that nearly nine-tenths (87.4 percent) of adolescents receiving services from federally funded runaway and homeless youth centers had last lived within 50 miles of the runaway shelter; more than half (52.2 percent) of the adolescents receiving such services had last lived within 10 miles of the shelter (66,72). Some geographic areas, such as Los Angeles and San Francisco, report relatively higher proportions of homeless adolescents coming from other areas (33,60). Of the adolescents using federally funded runaway and homeless youth shelters, about half have run away previously (72).

Service Needs of Homeless Adolescents on Their Own—Adolescents who are homeless and on their own are at greater risk than those in the general population for a number of health problems, including physical and mental health problems, substance abuse, pregnancy, sexually transmitted diseases, and physical and sexual abuse.

Physical Health—Few specifics are known about the physical health status and health care needs of unaccompanied homeless adolescents (4). Existing data suggest that many of the problems they experience are similar to those experienced by homeless children in families. For example, even when homeless adolescents find it relatively easy to find food (either through soup kitchens and shelters, or by purchasing food), their diets are often nutritionally deficient (42), and their poor diets may exacerbate medical problems (21).

In addition, the American Medical Association Council on Scientific Affairs notes that living on the streets makes it particularly difficult for homeless adolescents to perform routine tasks associated with personal hygiene (4). Thus, it is nearly impossible to follow treatment protocols such as keeping a wound clean. Resistance to disease is lower under the stressful conditions of living on the streets, so the chances of contracting infectious diseases are increased (57). Two-thirds of homeless adolescents in one study reported recent health problems (no further information available) (47). More than half had received medical treatment during the past year; about a fifth said that their health had become worse since becoming homeless.

Homeless adolescents ages 13 to 19 who were seen by 17 of the 19 Health Care for the Homeless projects funded by the Robert Wood Johnson Foundation and the Pew Memorial Trust suffered higher rates of nearly all acute disorders (e.g., upper respiratory infections, genitourinary problems, minor skin problems) and trauma as compared to adolescents included in the National Ambulatory Medical Care Survey (78). Homeless adolescents in this clinical sample also experienced chronic disorders (e.g., eye disorders such as poor vision, gastrointestinal disorders, ear problems such as otitis media (middle-ear infections) or impaired hearing, and dental problems) at nearly twice the rate of similarly aged adolescents in the National Ambulatory Medical Care Survey study. Nutritional disorders were also more common among the homeless adolescents (78).

Homeless adolescents on their own, as well as those with their families, face a number of barriers to receiving appropriate services. Older adolescents, in particular, may fall "between the cracks" as they fall outside of the jurisdiction of programs designed to serve children but do not yet have the full rights of adults. Such adolescents may not be eligible to receive public assistance (welfare) if they have not been legally emancipated through the court, may be excluded from shelters serving families or single adults, and may have difficulty gaining access to medical services without parental consent (4,5,59).[27]

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[27] For a general discussion of how parental consent requirements may affect adolescents' access to health care, see ch. 17, "Consent and Confidentiality in Adolescent Health Care Decisionmaking," in Vol. III.

Most homeless adolescents have no medical insurance coverage (46).[28] Often, adolescents believe that without money, they are ineligible to receive services such as medical care (4,5). Hospitals, including emergency rooms, are frequently the most common source of regular care. Greater use of hospital v. ambulatory care results in costly utilization patterns (46).

Mental Health—Homeless adolescents on their own frequently experience higher rates of mental health problems than adolescents in the general population.[29] There are anecdotal reports that the population of young people on the street is becoming younger, and more disturbed and dysfunctional (54).

Researchers report that homeless adolescents experience high rates of depression and are likely to have a history of suicide attempts. One study found that 83.6 percent of homeless and runaway adolescents were diagnosed as depressed through an interview by an examining physician (v. 24 percent of a sample of nonrunaway adolescents who also attended the same clinic), and 18.2 percent of homeless and runaway adolescents revealed a history of attempting suicide (as compared to 4 percent of nonrunaway adolescents) (79). Another study found that at least a third of the homeless adolescent females and 15 percent of the homeless adolescent males had previously attempted suicide (57). *Another* third of the homeless males and females had thought about attempting suicide. Other researchers report that nearly half of homeless adolescents had histories of suicide attempts, with 29 percent having attempted suicide in the previous year (38,53). Data from DHHS on adolescents served by federally funded runaway and homeless youth centers suggest that as many as 61 percent of these adolescents are depressed and that about 11 percent may be suicidal (72).

Almost a quarter of a sample of homeless adolescents in the Hollywood, California area had received inpatient mental health treatment at some time, although few had received any type of mental health treatment during the year prior to their being surveyed (38,47,53). Rates of mental disorders listed in the third edition of the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III) were found to be at least three times higher than those of a nonhomeless group of comparison adolescents (as assessed by items from the Diagnostic Interview Schedule and the Diagnostic Interview for Children and Adolescents, both of which are based on DSM-III). In addition to high levels of self-reported depression symptoms, a sizable portion (29 percent) reported four or more symptoms on a psychotic symptom index, further emphasizing the need that many of these adolescents have for mental health evaluation and possible treatment (38).

Adolescents in their sample of homeless and runaway adolescents in New York, Shaffer and Caton found, had a psychiatric profile similar to adolescents attending a psychiatric clinic (57). In addition, 38 percent of the adolescents Shaffer and Caton surveyed reported that they needed help for emotional problems; one-fifth had previously received psychiatric treatment. Shaffer and Caton concluded that much of the current psychiatric disturbance was present before the current runaway or homeless episode.

Substance Abuse—Various studies have reported high rates of substance abuse among homeless adolescents.[30]

Yates et al. found, for example, that 83.6 percent of the 110 homeless and runaway adolescents and young adults[31] using an outpatient medical clinic in Hollywood, California reported that they used drugs or alcohol (as compared to 67.0 percent of the 665 nonrunaway clients seen at the clinic) (79). These researchers also found that 34.5 percent of the homeless and runaway adolescents using the clinic had used intravenous drugs (as compared to 3.7 percent of their nonrunaway peers) (79).

A survey of adolescents and young adults ages 10 to 24 visiting an outpatient medical clinic in Los

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[28] For a general discussion of adolescents' problems with respect to health insurance, see ch. 16, "Financial Access to Health Services," in Vol. III.

[29] For a general discussion of mental health problems among adolescents, see ch. 11, "Mental Health Problems: Prevention and Services," in this volume.

[30] For a general discussion of substance abuse among adolescents, see ch. 12, "Alcohol, Tobacco, and Drug Abuse: Prevention and Services," in this volume.

[31] Fifty-two percent of the runaway clients were ages 10 to 17 (as were 34 percent of the nonrunaway clients), 40 percent of the runaways were ages 18 to 21 (as were 57 percent of the nonrunaways), and 8 percent of the runaways were ages 22 to 24 or of an unknown age (as were 9 percent of the nonrunaways).

Angeles found that an estimated half of the homeless and runaway adolescents seen were involved in drug abuse (54).

Shaffer and Caton reported that 70 percent of the homeless and runaway adolescents entering runaway shelters in New York City used drugs (57).

Robertson found that more than one-third of the 93 homeless adolescents interviewed in a study in the Hollywood, California area met DSM-III diagnostic criteria for drug abuse (47). This drug abuse rate among homeless adolescents (1 in 3) was five times greater than the rate reported for adolescents who were not homeless (47). About one-quarter of the homeless adolescents surveyed by Robertson reported having used drugs (e.g., heroin, cocaine) intravenously at least once (47). Robertson and her colleagues also found that more than one-third (38 percent) of the 93 homeless adolescents they interviewed in the Hollywood, California, area met the DSM-III criteria for alcohol abuse on dependence in the previous year and that nearly half (48 percent) of the 93 had an elevated lifetime prevalence of alcohol dependence or abuse (47,51,52). Robertson and her colleagues found that overall, 7.5 percent of the 93 homeless adolescents (13 percent of those diagnosed as alcohol abusers and 2 percent of the nonabusers) had ever received alcohol inpatient treatment. Only 18 percent of the homeless adolescent alcohol abusers had received treatment of any type in the previous year. The fact that so few received treatment was probably due in part to the fact that relatively few of the adolescents perceived their alcohol use to be a problem. Homeless adolescents with alcohol abuse problems were more likely to be male, white, and older than other homeless adolescents (mean age = 16.1 years; range: ages 13 to 17) (47,52). These adolescents also had more chronic histories of homelessness, were less likely to utilize shelters, and experienced greater difficulty in meeting other subsistence needs (e.g., food and clothing). These adolescents were more likely to have left home because of physical or sexual abuse, to have had a more chronic and extensive history of institutional contact, to have more mental health problems, and to abuse drugs.

Sexual and Reproductive Health—Several studies have found that most homeless and runaway adolescents have higher rates of sexual experience than other adolescents.

Yates et al. reported that nearly all of the 110 10- to 24-year-old runaway adolescents seen at an outpatient medical clinic in Hollywood, California (46.9 percent were ages 15 to 17, and 41.6 percent were ages 18 to 21) had had sexual intercourse (79). These investigators found that more than one-half (57.3 percent) of the runaway street adolescents and young adults in their Los Angeles study had had sexual intercourse before the age of 15 (as compared to 31.0 percent of the nonrunaways) and that almost 20 percent of the runaway street adolescents and young adults in their study had had sexual intercourse before age 10 (as compared to 2.1 percent of the nonrunaways) (79).

Roberston similarly found that nearly all (92.3 percent) of the 93 homeless adolescents she surveyed in various settings in the Hollywood, California area reported being sexually active (mean age = 16.1 years) (47). Forty percent of the homeless adolescents Robertson surveyed reported being sexually active by age 13 (47).

Furthermore, Shaffer and Caton, in their study of 118 adolescents entering runaway shelters during a 2-week period in New York City, found that three-quarters of adolescents under the age of 18 reported that they had engaged in sexual intercourse (57).

Even though most homeless adolescents are sexually active, few of them report consistent use of contraceptives (46,57). Homeless adolescents who engage in unprotected sexual intercourse are at increased risk of pregnancy and sexually transmitted diseases (STDs).[32] Various studies have reported high rates of pregnancy for homeless female adolescents.[33] In their sample of adolescents entering runaway shelters during a 2-week period in New York City, for example, Shaffer and Caton found that one-third of the homeless female adolescents they interviewed (mean age = 15.7 years old) had been pregnant (57). Almost half (44.4 percent) of the homeless female adolescents surveyed by Robertson in the Hollywood, California area had been pregnant

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[32] For a general discussion of adolescent pregnancy, see ch. 10, "Pregnancy and Parenting: Prevention and Services," in this volume. The risk of STDs among adolescents is discussed in ch. 9, "AIDS and Other Sexually Transmitted Diseases: Prevention and Services," in this volume.

[33] For a general discussion of pregnancy rates among adolescents, see ch. 10, "Pregnancy and Parenting: Prevention and Services," in this volume.

(47). National data indicate that about 40 percent of all young black women and a fifth of young white women have been pregnant before the age of 18—older than the adolescent females in these samples (29).

Of homeless females ages 13 to 15 seen by Health Care for the Homeless projects funded by the Robert Wood Johnson Foundation and the Pew Memorial Trust, 14 percent were pregnant at or after their first contact with the project, as were 31 percent of females ages 16 to 19 (data are not reported on lifetime pregnancies) (78). The pregnancy rate among these homeless females was more than 10 times the pregnancy rate reported for females ages 13 to 15 in the National Ambulatory Medical Care Survey; in fact, it was at least 3 times the pregnancy rate reported for females ages 16 to 19 in that survey.

Homeless and runaway adolescents participate in street prostitution (often for "survival," i.e., in exchange for food, shelter, or money with which to purchase food or shelter) at relatively high rates.

Nearly 30 percent of homeless adolescents (31 percent of females; 28 percent of males) surveyed by Robertson in the Hollywood, California area reported that they engaged in prostitution; they were more likely to engage in prostitution during periods of homelessness than when they were housed (46).

Similarly, 35 percent of those seen at the Larkin Street Youth Center in San Francisco reported that they had engaged in prostitution, primarily for economic reasons (33).

Yates et al. reported that 26 percent of runaway street adolescents seen at an outpatient medical clinic in Hollywood, California engaged in prostitution (as compared to only 0.2 percent of nonrunaway adolescents seen at the same clinic) (79).

Lower rates of prostitution among homeless adolescents are reported for clients of The Bridge, a multiservice agency in Boston, Massachusetts. There, less than 20 percent of homeless adolescents are reported to have resorted to prostitution (43).

Particularly in some areas, such as San Francisco and Los Angeles, relatively high numbers of homeless adolescents are reported to be homosexual (32,80). A Seattle survey found that 40 percent of a sample of street adolescents identified themselves as gay, lesbian, or bisexual (56). A fifth of males using a New York City shelter reported that they were gay (61). Frequently, these adolescents have been rejected by their families because of their sexual orientation. Once on the streets, they are particularly vulnerable to violence and victimization (1,80).

Because they are more frequently involved in sexual activity (including both homosexual and heterosexual prostitution) and intravenous drug use, homeless adolescents are at higher risk for infection with human immunodeficiency virus (HIV), the virus that causes AIDS (16,28,80). An ongoing study at Covenant House shelter in New York City, in which clients receive a health assessment upon admission to the facility, indicates that 6 to 7 percent of adolescents (ages 15 to 20) screened tested positive for AIDS antibodies (61).

Runaway and homeless youth centers in all 10 Federal regions report that one of their primary health concerns is the prevention of STDs and care for victims of STDs and AIDS among runaway and homeless youth (72). DHHS, with the involvement of its National Institute on Drug Abuse, has begun to provide AIDS prevention training to staffs of federally funded runaway and homeless youth centers (30).

Physical and Sexual Abuse—Researchers report that large numbers of homeless adolescents were subjected to physical or sexual abuse prior to becoming homeless (6,21,31,36,47,58).

More than 60 percent of a sample of 75 homeless adolescents surveyed in San Francisco, reported that they had been sexually abused before leaving home (28). A study of 187 Canadian adolescents and young adults ages 16 to 21 who were receiving services at a shelter for runaway and homeless youth revealed that 81 percent experienced severe physical abuse at home (6). This abuse was most frequently perpetrated by a parent.

In the fiscal year 1984 annual report on federally funded runaway and homeless youth centers, DHHS reported that for about one-third of young female adolescents and one-fifth of young male adolescents using centers, physical or sexual abuse by family members or others was a problem that led to their running away (71).

Over one-third (37.2 percent) of the sample of 93 homeless adolescents surveyed by Robertson in the Hollywood, California area reported that they had left home at least once because of physical abuse; 10.7 percent reported that they had left home because of sexual abuse (47). A fifth of the homeless adolescents in this sample had been removed from their homes at some time because of abuse or neglect—an observation that corroborates the belief that many of these homeless adolescents had, in fact, come from abusive households.

In a New Jersey sample of 536 adolescents using runaway and homeless youth center services (of whom 60 percent were considered to actually be homeless), almost half reported physical or emotional abuse, and over 10 percent reported sexual abuse at home (58).

Sexual and physical victimization continue to be a fact of life for many adolescents living on the street (79). Yates et al. reported that 3.6 percent of the 110 runaway and homeless adolescents seen at an outpatient medical clinic in Hollywood, California (as compared to 1.4 percent of the 655 nonrunaway adolescents seen at the clinic) were treated for trauma (79). They also reported that 1.8 percent of the runaway and homeless adolescents seen at this clinic were treated for rape (as compared to 0.5 percent of nonrunaway adolescents seen at the clinic) (79).

Robertson found that 42 percent of the 92 homeless adolescents in her study in the Hollywood, California area reported physical abuse, and 13 percent reported sexual abuse in the past year (46). The fact that the number of homeless adolescents reporting sexual abuse in Robertson's study (13 percent) is low in comparison to the number reporting that they engaged in prostitution (29.7 percent) suggests that the homeless adolescents Robertson surveyed did not perceive the exchange of sexual favors for food, shelter, or protection (survival sex) as constituting sexual abuse. Consequently, the self-reports of sexual abuse among these adolescents may be low.

A survey of young people using Los Angeles County shelters found that about half of them had a history of abuse and neglect (35).

Education—A recent GAO study found that 37 percent of adolescents receiving shelter services at federally funded runaway and homeless youth centers between October 1985 and June 1988 were not attending school (66). Half of those age 16 or older had either dropped out of school, been expelled, or been suspended.

Several researchers have reported that most homeless adolescents have poor histories of school adjustment (42). Shaffer and Caton, for example, reported in their study of 118 adolescents entering runaway shelters during a 2-week period in New York City, found that three-quarters of the males and one-half of the females they interviewed had been expelled from school at some time, most for fighting or drug use (57). About half of the adolescents they interviewed had repeated a grade (57). Data from DHHS on runaway and homeless adolescents using federally funded runaway and homeless youth centers indicate that more than one-fourth of these adolescents had problems with school attendance, about a quarter had poor grades, and almost 10 percent had difficulties with teachers (72).

Staying in school after leaving home can be very difficult for runaway and homeless adolescents. Adolescents on their own face significant problems (e.g., finding places to study, obtaining appropriate records, need for day-care facilities if they are young parents) similar to those described for homeless adolescents staying with their families in shelters. They face additional problems if they do not have a guardian who can enroll them in a school. If they wish to enroll in a new school district, for example, it may be particularly difficult for them to obtain appropriate records and signatures if they are estranged from their guardian(s) (40). A survey of young people in Los Angeles County reported the need for services to help homeless adolescents return to school, including the need for testing to determine any need for special services (35).

Illegal Activity/Juvenile Justice System Involvement—As noted above, some homeless and runaway adolescents use illegal drugs, engage in prostitution, or participate in other types of illegal activities that may bring them into contact with the juvenile justice system.[34]

Adolescent males, in particular, are reported to have experienced contact with the justice system (72). For nearly a quarter (23.7 percent) of adolescent males receiving ongoing services from runaway and homeless youth centers in fiscal year 1987, being "in trouble with the justice system" was cited as a problem that had contributed to their leaving their last residence (as compared to 9.7 percent of the adolescent females). Over 10 percent (11.8 percent) of males and less than 5 percent (3.8 percent) of females receiving services from the centers cited "being in trouble with the juvenile justice system" or law enforcement as being their *primary* reason for seeking services at the center. Furthermore, 1.9 percent of the adolescents served by the runaway and homeless youth centers (2.6 percent of males; 1.4 percent of females) were expected to reside in correctional institutions after receiving services at the centers.

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[34] For a discussion of other offenses that may bring adolescents into contact with the juvenile justice system, see ch. 13, "Delinquency: Prevention and Services," in this volume. As noted in that chapter, running away itself may bring adolescents into contact with this system.

Many of the adolescents in Robertson's sample of 93 homeless adolescents in the Hollywood, California area reported that they obtained income from illegal activities such as panhandling, prostitution, and drug dealing (46). Some of these activities were adaptive behaviors in which homeless adolescents engaged to provide for basic needs (e.g., breaking and entering to get a place to stay). Many adolescents in this study reported that they only engaged in these behaviors when they were homeless or that they engaged in these behaviors more frequently when they were homeless.

Robertson found that homeless adolescents who abused alcohol were more likely than other homeless adolescents to engage in illegal and problem behaviors (46). They were almost twice as likely to have sold drugs (half of those doing so to support their own drug habit), and more likely to trade sex for drugs or money.

More than one-third (37 percent) of the males and almost a fifth (19 percent) of the females surveyed by Shaffer and Caton in their study of adolescents entering runaway shelters during a 2-week period in New York City reported that they had been charged with an offense (e.g., assault or robbery) at some time (57). A minority (22 percent of males; 10 percent of females) had been in a detention center previously; 12 percent of the males had been in a work camp or prison. About a quarter of the males (28 percent) and 12 percent of the females reported that they had stolen something in the previous 3 months. Males were significantly more likely than females to have been charged with an offense, gone to court, and to have been convicted or incarcerated.

Training in Independent Living—In addition to needing physical and mental health services, homeless adolescents often have a need for training in independent living skills, including vocational training (19).

In 1985, the Hollywood Homeless Youth Project in Hollywood, California, reported that 86 percent of the adolescents requesting services wanted job training and placement, half wanted help in finding shelter, and half requested school services (54). Shaffer and Caton also reported that adolescents most wanted help in finding a job (57). Another half wanted counseling for problems with thoughts and feelings. Other homeless adolescents have reported that a primary goal was to find their own apartment (19). This goal can be particularly difficult to achieve because unemancipated minors cannot legally enter into a contract such as a lease (49).

Major Federal Policies and Programs Pertaining to Homelessness

Primary responsibility for addressing the needs of the homeless has traditionally been held by various private charities, religious groups, and nonprofit agencies. Through missions, private shelters, clothing closets and the like, the private sector has responded to meet the most basic needs of society's poorest individuals. While few deny that the Federal Government must make some response, there is controversy as to whether the Federal Government should take a primary role in responding to the problem. Some believe that alleviating the homelessness crisis requires solutions that have to be implemented at the national level. Others believe that discretion for programming should be retained at the State or community level, with private and civic groups working together to solve what are essentially local problems.

The primary mechanism for providing direct services to homeless families is through temporary shelters. Although shelters for the homeless increasingly serve as sites for the provision of services beyond simple shelter (e.g., mental health services, health care services), they generally do *not* fully address the multiplicity of needs of sheltered families and individuals. Shelters where homeless families with adolescents stay are often squalid and dangerous. Privacy is sometimes totally lacking, and families may be housed barracks style with dozens of other families (20). Welfare hotels, where families are housed together in one room, sometimes for a year or longer, are frequently in the worst parts of

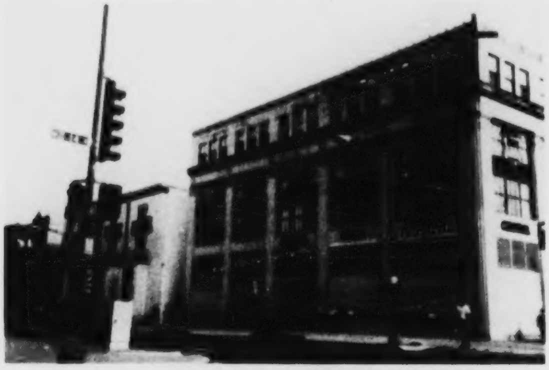

Photo credit: Office of Technology Assessment

Traditionally, the private sector has taken primary responsibility in addressing the needs of the homeless through private charities, religious groups, and nonprofit agencies. Whether the Federal Government should assume a primary role in providing for the homeless, including adolescents, is a controversial topic.

the cities, expose children to the dangers of substance abuse and crime, and may contain such environmental risks as lead-based paint and exposed wiring. Shelters and hotels rarely have a place where adolescents may play, either inside or outdoors. Cooking and refrigeration facilities are often lacking. Families may resort to prohibited hotplates for cooking; perishable items may be kept in coolers or toilet tanks (11,25).

A number of existing Federal programs seek to address the emergency needs of poor people, including the homeless. Until budgets were severely cut during the 1980s, the Federal Government took a rather active role in developing a national stock of low-income housing. Traditional welfare programs such as AFDC provide some income security for needy children and their parent(s). Medical care is available for low-income persons through the Medicaid program and federally funded community health centers.[35] Nutritional assistance is available through enrollment in the Food Stamp Program, the Temporary Emergency Food Assistance Program, and participation in the Supplemental Food Program for Women, Infants, and Children.[36] A variety of Federal block grant funds may be used to fund services or fund programs that are utilized by the homeless (e.g., the alcohol, drug abuse, and mental health services block grant; maternal and child health block grants; community development block grant funding; and the social services block grant).[37]

As the need for emergency housing has become more acute, many States have taken advantage of the "emergency assistance" and "special needs" funds available under the AFDC program to help families at risk of becoming homeless (69,69a). This program, in which States may voluntarily participate, allows for the limited use of Federal matching funds to secure temporary shelter and other emergency assistance for needy families with children who are at risk of becoming homeless. Though the funds are designed to provide critical aid to at-risk families, however, they are now being used in some areas to shelter families for extended periods of time in "welfare hotels." Because of Federal restrictions on the use of the funds, they may not be used for permanent housing even when this housing would be far less costly. In 1990, the Cranston-Gonzalez National Affordable Housing Act (Public Law 101-625) addressed this problem by authorizing the use of grants to help eligible families make the transition to permanent housing (see below).

In addition to Federal programs intended to address the needs of poor people in general, there are a number of Federal programs designed to address the needs of homeless people specifically. Several of these are discussed below. The majority of these programs focus on the emergency needs of the homeless population as a whole rather than the specific needs of homeless adolescents.

Emergency Aid to the Homeless and the McKinney Homeless Assistance Act

Congress has a relatively short history of dealing directly with the problem of homelessness. For the most part, the legislative response has focused on the homeless population in general and has not specifically targeted the needs of homeless adolescents. Initially, because homelessness was thought to be a temporary crisis, legislative efforts were of a short-term or emergency nature (69).

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[35] For information on the Medicaid program, see ch. 16, "Financial Access to Health Care," in Vol. III. Federally funded community health centers are discussed in ch. 18, "Issues in the Delivery of Services to Selected Groups of Adolescents," in Vol. III.

[36] For information on the Food Stamp Program and the Supplemental Food Program for Women, Infants, and Children, see ch. 7, "Nutrition and Fitness Problems: Prevention and Services," in this volume.

[37] Several block grant programs are discussed in ch. 19, "The Role of Federal Agencies in Adolescent Health," in Vol. III.

In 1983, Congress appropriated $100 million for the Emergency Food and Shelter Program to be funded through the Federal Emergency Management Agency (Public Law 98-8). This legislation allowed locally created boards consisting of representatives of charitable organizations and community leaders to distribute funds to local groups providing emergency services to the needy, including the homeless. It also appropriated $125 million for the Temporary Emergency Food Assistance Program, which provided for the distribution of surplus food commodities to the needy through the U.S. Department of Agriculture. Subsequent legislation, including legislation in 1987, extended funding for the Emergency Food and Shelter Program and the Temporary Emergency Food Assistance Program (Public Law 98-92, Public Law 99-198, Public Law 100-77).

During the 100th Congress, 1987 through 1988, the problem of homelessness was elevated to a higher priority on the legislative agenda. In 1987, Congress passed a supplemental appropriations act providing $50 million in emergency relief funds for the homeless (Public Law 100-6). Then Congress began work on a comprehensive homeless aid package, the Stewart B. McKinney Homeless Assistance Act, which was signed into law in July 1987 (Public Law 100-77). The 1987 McKinney Homeless Assistance Act authorized funds for a comprehensive range of health, mental health, transitional housing, emergency food and shelter, education, substance abuse, and social services for homeless people. One section of the act (section 613) added a new section (512(c)) to the Public Health Service Act, which authorized funds for a new program of demonstration projects for alcohol and other drug treatment for homeless individuals. Companion legislation passed by Congress provided $355 million for funding McKinney Act programs in fiscal year 1987 appropriations (Public Law 100-71); $358 million was appropriated for fiscal year 1988 (Public Law 100-202).

The 1987 McKinney Homeless Assistance Act contains a number of provisions pertaining to housing, including a provision that authorizes funding for emergency shelter and supportive housing demonstration projects (including special funding of at least $20 million for projects serving homeless families with children); and a provision that authorizes the conversion of unused government buildings into homeless shelters. A number of programs under the U.S. Department of Agriculture were authorized by the 1987 McKinney Act, including outreach programs to inform homeless persons about food stamps, expedited service for homeless persons applying for food stamps, and extended funding for the Temporary Emergency Food Assistance Program. In addition, the legislation established a 3-year Interagency Council on the Homeless at the Federal level.

To ensure access to public education for homeless children, the 1987 McKinney Homeless Assistance Act provided for grants for each State to establish an Office of Coordinator of Education for Homeless Children and Youth. All States but one, plus the District of Columbia, the Virgin Islands, American Samoa, and Puerto Rico, received fiscal year 1988 funds under the program (69).[38] The Office of Coordinator of Education for Homeless Children and Youth in each State is responsible for the following:

- gathering data on the extent of child and adolescent homelessness in the State,
- determining what problems homeless children and adolescents have in gaining access to public schools,
- identifying special educational needs of homeless children and adolescents, and
- developing State plans for providing educational services to all homeless children and adolescents in the State.

The McKinney Act also provided grants for programs that "successfully" address the needs of homeless elementary and secondary students, and authorized up to $50,000 for demonstration grants to study the underlying causes of adolescent homelessness.

In 1988, Congress reauthorized and expanded the McKinney Act (Public Law 100-628). The 1988 law included provisions requiring DHHS to recommend legislative and regulatory changes designed to eliminate the use of emergency assistance funds to pay for sheltering families in welfare hotels and authorized funding for at least two (but not more than three) demonstration projects designed to reduce the number of homeless families in welfare hotels. Funded demonstration projects would be required to make transition facilities available, reducing permanently the number of rooms used to house families in welfare hotels by the number of units made available in transition facilities. In 1988, Congress appropriated a total of $78 million for McKinney Act service programs through the U.S. Departments of Labor, Health and Human Services, and Education and Related Agencies Appropriations Act (Public Law 100-436); it appropriated $285 million for Federal Emergency Management Agency and U.S. Department of Housing and Urban Development programs authorized by the McKinney Act (Public Law 100-404).

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[38] Hawaii did not apply for fiscal year 1988 funds, but did apply for fiscal year 1989 funds under the program.

In 1989, Congress appropriated $151.6 million for McKinney Act service programs through the U.S. Departments of Labor, Health and Human Services, Education, and related agencies (Public Law 101-166). It appropriated $414.5 million for Federal Emergency Management Agency and U.S. Department of Housing and Urban Development programs authorized by the McKinney Act (Public Law 101-144). In 1990, an additional $3.2 million was appropriated for health services for the homeless (Public Law 101-302).

Congress reauthorized and further expanded the McKinney Act provisions in the Stewart B. McKinney Homeless Assistance Act Amendments of 1990 (Public Law 101-645). These amendments provided grants for demonstration programs to enhance comprehensive primary health services for homeless adolescents and their families through various mechanisms. Title V of the amendments provides for comprehensive primary health services for homeless children that may be delivered by some providers without Medicaid status. Title VII provides for grants to establish Family Support Centers, which would serve to enhance the physical, social, and educational development of children, including nutritional services, screening and referral, drop-out prevention services, job training services, and for parents' supportive services. Title VI of the amendments expands the educational components of the 1988 amendments, stressing the importance of coordination between the various State and local agencies that come in contact with homeless children (e.g., departments of education and social services, shelters, and youth centers), and the removal of school enrollment barriers (e.g., immunization, residency, school documents, and guardianship issues).

In December 1988, with the addition of new McKinney funds, the National Institute of Mental Health within DHHS announced that it would make available grant funds for research and research demonstrations on homeless severely mentally ill adults and homeless families with children who were at risk of severe emotional disturbance (74). In fiscal year 1989, the National Institute of Mental Health made available approximately $2.5 million to support new research grants, and up to $2 million in additional funds were available to support new research demonstration grants to evaluate promising new programs for the homeless in actual service settings. Although homeless adolescents were identified as a possible focus for these grants in the December 1988 program announcement, no grants targeted toward adolescents were awarded in the first cycle of funding.

In January 1990, the National Institute on Alcohol Abuse and Alcoholism, in consultation with the National Institute on Drug Abuse, announced that it would be implementing a provision of the McKinney Homeless Assistance Act of 1988 by making available cooperative agreement awards for research demonstration projects for alcohol and/or other drug treatment of homeless people (73a). It urged applicants to give special attention to the inclusion of minorities and women in the research application and encouraged the submission of applications that addressed the special needs of homeless subpopulations such as women with children, adolescents, young adult males, chronic public inebriates, and individuals with alcohol and/or other drug problems concomitant with a mental illness.

Cranston-Gonzalez National Affordable Housing Act

In November 1990, Congress passed for the Cranston-Gonzalez National Affordable Housing Act (Public Law 101-625). One of the provisions of the act makes funds available for implementing an approved housing policy strategy at the State and local levels. The act could benefit adolescents who are homeless with their families by providing further funding for low-income housing projects, providing additional support for first-time home buyers, and in other ways. The act specifically makes low-income housing available "to families identified as having a lack of adequate housing that is a factor in the imminent placement of a child in foster care or in preventing the discharge of a child from foster care and reunification with his or her family."

The act also includes grants (given a 50-percent State or community funding match) for public housing youth sports programs which utilize community centers, parks or playgrounds, and provides for the salaries and expenses for staff. The maximum Federal grant amount annually for each housing project is $125,000.

Runaway and Homeless Youth Act

In 1974, Congress passed and appropriated funds for the Runaway Youth Act as Title III of the Juvenile Justice and Delinquency Prevention Act of 1974 (Public Law 93-415). The Runaway Youth Act has since been reauthorized several times (Public Law 95-115; Public Law 96-509; Public Law 98-473; Public Law 100-690). The Runaway Youth Act authorized grants to community-based agencies to develop or support programs addressing the needs of runaway adolescents (ages not specified; however, in fiscal year 1987, 93.4 percent of the individuals receiving ongoing services at federally funded centers were ages 12 to 17 (72)). In 1977, Congress extended Title III of the Juvenile Justice and Delinquency Prevention Act of 1974 to serve homeless as well as runaway adolescents. Congress took this action in response to pleas from service providers and advocates that many of the "runaway" young people served by the programs could not be reunited with their families, and so were actually homeless (68).

Programs under the Runaway and Homeless Youth Act are administered by the Administration for Children, Youth, and Families within the Office of Human Development Services of DHHS. In April 1991, the Secretary of Health and Human Services announced a reorganization of some DHHS programs for children and families (70a). As announced, the reorganization would combine all programs currently in the Family Support Administration and the Office of Human Development Services, and the maternal and child health block grant program in the Health Resources and Services Administration of the Public Health Service, into a new "Administration for Children and Families" (70a). In general, programs funded through the Runaway and Homeless Youth Act are intended to meet short-term emergency needs. The four general purposes of programs described in the act are as follows:

- to alleviate the problems of runaway and homeless youth;
- to reunite children with their families and to encourage the resolution of intrafamily problems through counseling and other services;
- to strengthen family relationships and encourage stable living conditions for children; and
- to help youth decide on a future course of action.

Runaway and homeless youth centers funded under the Runaway and Homeless Youth Act provide emergency shelter for up to 15 days, with the goal of reuniting adolescents with their families. The centers also provide services that include individual and family counseling, outreach, and referrals and aftercare assistance in areas such as health, employment, and education (66,71).

During fiscal year 1987, Runaway and Homeless Youth Act funds were used to make awards to 307 runaway and homeless youth centers, an increase from the 286 centers funded the year before (71). Funds were transferred from the Administration for Native Americans for funding of an additional four centers in fiscal year 1987 to serve Native American adolescents. In fiscal year 1989, financial support was provided to 343 grantees (30). Many of these grantees actually operate more than one service site; the actual number of service sites may be almost double the number of grantees. The Runaway and Homeless Youth Act also provides for limited funding of demonstration projects, including options such as transitional living programs for homeless and runaway adolescents.

During fiscal year 1987, federally funded runaway and homeless youth centers provided services to an estimated 340,000 adolescents, 56,000 of whom were provided shelter, ongoing counseling, or other services (72). Although the mandate of the Runaway and Homeless Youth Act now includes the provision of services to adolescents who are homeless, homeless adolescents frequently require more intensive services than those that can be provided through the centers. Homeless adolescents can rarely secure a positive living arrangement after only 15 days at a runaway shelter because, for example, family reunification is not always a viable option. A Los Angeles study found that only 19 percent of adolescents seen in shelters were good candidates for immediate family reunification (35).

Federal Runaway and Homeless Youth Act funds provide only a portion of the funds used by runaway and homeless youth centers. Such centers also receive funds from a number of other sources, including State and local governments, local United Ways, religious groups, foundations, corporations, and other private sources (41). Many also rely heavily on the use of volunteers. A 1985 survey of 210 agencies serving runaway and homeless adolescents found that 75 percent received some funding from Runaway and Homeless Youth Act funds, which covered about a third of their budgets. Shelters relied on an average of five public and private funding sources in addition to these funds (see box 14-B).

In addition to supporting runaway and homeless youth centers, the Runaway and Homeless Youth Act supports a National Runaway Switchboard. This switchboard, which provides counseling and referral services to adolescents and their parents, handles some 250,000 calls per year, 90 percent of them from young people (about 20 percent of these callers used the service to contact their families) (72). Since fiscal year 1985, the National Runaway Switchboard has also served as the Adolescent Suicide Hotline; it gets about 2,500 suicide-related calls per month.[39]

In 1988, the Runaway and Homeless Youth Act (H.R. 1801) was incorporated into the Anti-Drug Abuse Act of 1988 (H.R. 5210) and reauthorized during the 100th Congress (Public Law 100-690). Congress appropriated $26.9 million for the Runaway and Homeless Youth Act for 1989 (Public Law 100-690); it appropriated $28.8 million for 1990 (Public Law 101-204). In addition to continuing authorization for funding of shelter programs and runaway hot lines, the law reauthorizing Runaway and Homeless Youth Act programs authorized a new transitional living program for homeless adolescents and young adults ages 16 to 21, provided other runaway programs are fully funded. Transitional living programs are structured programs that provide shelter while helping young people develop the skills they need to live on their own. Transitional living programs would provide a variety of services, including counseling in interpersonal and life skills. No more than 20 young people would be served at one time by each program, and shelter and services would not be provided for more than 18 months. It was not until 1990 that a total of $19.8 million was appropriated for transitional living program grants to be made in fiscal years 1990 and 1991 (41). Evaluation of funded programs was to begin late in 1991, and grantees are required to submit annual reports to DHHS on their activities and achievements (42 U.S.C. 5714-2). The Young Americans Act of 1990 (Public Law 101-501) also allows for, but does not require, grants to be made for transitional living services to young individuals who are homeless, with no age restriction specified.

Photo credit: Sasha Bruce Youthworks

Transitional living programs are structured programs that provide shelter to young people while helping them develop the skills they need to live on their own.

Barriers to Care Under the Runaway and Homeless Youth Act

Organizations that provide services to homeless and runaway adolescents face a number of barriers to providing effective services (35,41) and shelter providers report that they cannot always provide services for all adolescents in need. A survey of shelter agencies in Los Angeles County found, for example, that providers turn away six young people for every five they serve. Los Angeles County has only 112 shelter beds, despite a homeless and runaway adolescent population that may be as great as 10,000 at any one time (35).

Staff turnover in shelters is reported to be high, in part because of the low salary base. While shelter providers function to link adolescents with other community services, they report a lack of a contin-

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[39] For a discussion of suicide hot lines, see ch. 11, "Mental Health Problems: Prevention and Services," in this volume.

Box 14-B—Bridge Over Troubled Waters: An Agency Serving Runaways and Homeless Street Youth

Bridge Over Troubled Waters is a multiservice agency in Boston, Massachusetts, that is designed to meet the shelter and service needs of runaways and homeless street youth. It currently serves some 4,000 young people ages 13 to 25—most of them are ages 16 to 21—each year (14). As noted further below, Bridge receives funds from a combination of public and private sources.

Programs and Services

When it was founded in 1970, Bridge consisted of three programs:

- a streetworker outreach program,
- medical van services, and
- counseling (14).

Over the years, Bridge programs have been expanded to include:

- a free dental clinic,
- a runaway program,
- an education/pre-employment program,
- a Family Life Center for pregnant and parenting young women, and
- the Bridge Houses and several other residential programs that offer housing options for targeted groups of homeless adolescents (e.g., single parents, long-term street youth with substance abuse problems, and high school-aged runaways).

All Bridge services are provided without cost to recipients.

Outreach—Bridge uses streetworkers to make informal contact with homeless and runaway young people and to inform them of the services available through Bridge (14). The goal of the outreach program is to establish a trusting relationship with homeless and runaway young people, so that those in need of service will eventually feel safe and comfortable asking for the services they need. Bridge streetworkers conduct outreach on weekday afternoons and evenings in a range of areas where young people are known to gather. In 1989, streetworkers contacted over 3,000 homeless and runaway young people.

Medical and Dental Services—Bridge provides free medical services through its free medical van and in-house clinic (14). The Bridge medical van is staffed by volunteer physicians and nurses. Each weeknight, the van makes stops at places where young people gather and provides onsite medical care. The in-house clinic operates 1 day per week and is staffed by a nurse practitioner. In 1989, approximately 2,000 individuals received medical services through the free medical van, and the nurse practitioner at the in-house clinic saw 187 patients.

Since 1972, Bridge has provided free dental services at the dental clinic located at the agency's downtown facility (14). Complete treatment and restorative services are provided by a pool of volunteer dentists, hygienists, and dental assistants. In 1989, 482 young people received services at the dental clinic.

Counseling—Bridge provides a range of counseling services to its clients (14). On the basis of the results of an intake assessment to determine their service needs, clients are assigned to a long-term counselor. The counselor then works with the client to identify issues of concern and to develop a treatment plan to address those issues. Treatment plans are reviewed frequently by the client and his or her counselor, and are updated at least every 6 months. In 1989, 2,158 clients received services through the counseling program.

Runaway Program—Through its runaway program, Bridge provides crisis services to adolescents under age 18 who have left home and are on the streets with no place to go (14). The runaway program provides food, clothing, and shelter in the home of an emergency shelter care volunteer. Efforts are made through the program to reunite runaway adolescents with their parents; where family reunification is not appropriate (e.g., where there is a risk of physical or sexual abuse, or there is severe family dysfunction), however, efforts are made to find alternative housing, sometimes in the Bridge Houses (see below) operated by Bridge. Each year, runaway program services are provided to over 400 adolescents.

Education/Pre-Employment Services—Through the Education/Pre-Employment Program, Bridge staff provide tutoring for young people working toward completing the general educational development (GED) program (14). A job developer works with these students, as well as other interested clients, to develop job readiness and interviewing skills. The Bridge Family Life Center provides support to pregnant and parenting young women, including providing instruction in prenatal care, child development, and health and nutrition (14). Individual counseling is also provided, along with life skills education. Child care is available to enable mothers to attend GED classes.

Residential Programs—Bridge has several residential programs (14). The two Bridge Houses provide shelter to a total of 32 residents for a period of 6 to 8 months. The Bridge Houses target different groups of homeless: adolescents and young adults reside in one Bridge House, and single parents and their children reside in another (12). Residents participate in programs focusing on education and building independent living skills; they are required to participate in weekly group counseling, individual counseling, and daily cooking and cleaning (14). They must attend high school or a GED program and hold a job. Residents are also required to pay rent based on their income. Staff, who are responsible for supervising residents' activities, coordinating job development and recreational activities, and providing counseling on house-related issues, are on duty 24 hours per day. Six Bridge transitional apartments provide housing for 15 graduates of Bridge Houses, along with an additional year of informal supervision and support services (14). Bridge staff provide support to aid residents in their final transition to independent living.

Funding

Program expenses for Bridge in 1989 were $1,481,214. Residential programs accounted for the largest portion of expenses (42 percent). Runaway, counseling, and streetwork outreach accounted for the next largest portion (31 percent) (13). In 1988, program expenses exceeded revenue by nearly $60,000. In 1989, however, increases in funding, primarily from grants and contracts from foundations and additional funding from United Way, allowed Bridge to show a surplus of revenue.

Bridge receives funding from a combination of sources (13). Funding for 1990 was from the following sources:

- 40 percent from public grants and contracts (13 percent of total funding is from Federal sources, 23 percent from the State, and 5 percent from the city);
- 22 percent in the form of grants and contributions from foundations,
- 25 percent from United Way,
- 7 percent from individual contributions, and
- 5 percent from other sources such as local charities.

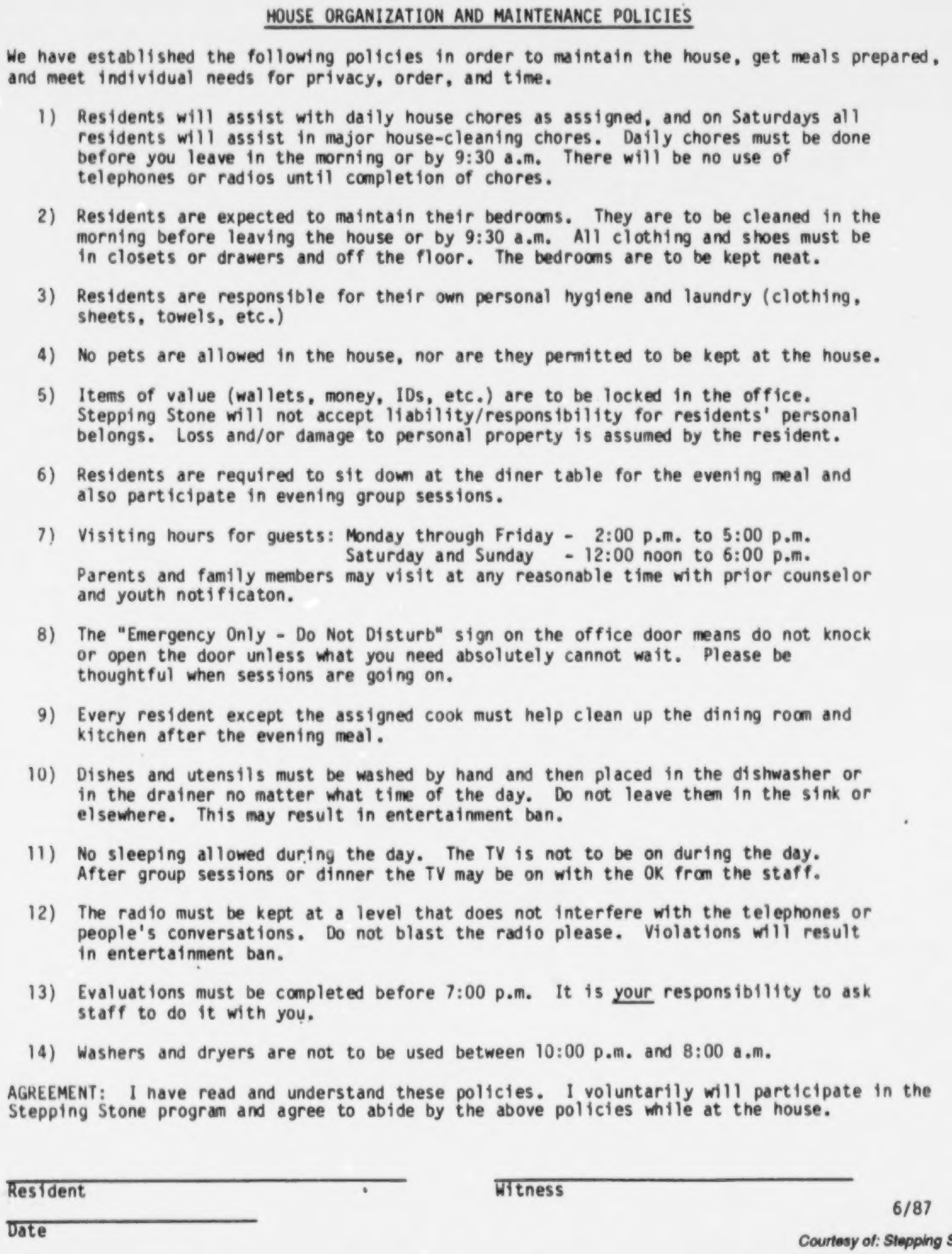
Federal funding for Bridge comes through the the Runaway and Homeless Youth Act administered by the U.S. Department of Health and Human Services, and includes discretionary funding for a 3-year demonstration grant to Bridge for the single-parent house and the transitional apartments.

uum of needed services. In particular, they report a lack of drug detoxification and inpatient drug abuse treatment facilities, and of acute mental health beds and programs to provide followup services after discharge from inpatient care. Service providers also cite the lack of transitional living programs to help adolescents learn important skills for living on their own (e.g., managing finances, problemsolving, and employment and training) (35,41).

Shelter staff are supposed to develop plans for living arrangements and other needs of clients served by runaway and homeless youth centers. According to a study by GAO, however, no aftercare plans are made for almost half of homeless adolescents using the shelters. Furthermore, the plans that are made may be insufficient to fully address the needs of the homeless adolescent (66). For example, although drug or alcohol abuse problems were reported for over a fifth of homeless adolescents served during the study period, drug or alcohol treatment was planned for only 4 percent.

Effectiveness of Runaway and Homeless Youth Services

In part because of the barriers to service discussed above, shelters have shown mixed success in placing homeless adolescents in more stable living situations. A recent GAO study reported that about one-third of the homeless adolescents (as compared to 58 percent of runaway adolescents) using federally funded runaway and homeless youth shelters between October 1985 and June 1988 planned to live with a parent or other relative upon leaving the shelter (66). Approximately 20 percent of the homeless adolescents using these shelters expected to enter foster or group homes, and 6 percent expected to enter independent living. On the other hand, 14 percent expected to live with friends or on the street, 6 percent expected to live in another



HOUSE ORGANIZATION AND MAINTENANCE POLICIES

We have established the following policies in order to maintain the house, get meals prepared, and meet individual needs for privacy, order, and time.

1) Residents will assist with daily house chores as assigned, and on Saturdays all residents will assist in major house-cleaning chores. Daily chores must be done before you leave in the morning or by 9:30 a.m. There will be no use of telephones or radios until completion of chores.

2) Residents are expected to maintain their bedrooms. They are to be cleaned in the morning before leaving the house or by 9:30 a.m. All clothing and shoes must be in closets or drawers and off the floor. The bedrooms are to be kept neat.

3) Residents are responsible for their own personal hygiene and laundry (clothing, sheets, towels, etc.)

4) No pets are allowed in the house, nor are they permitted to be kept at the house.

5) Items of value (wallets, money, IDs, etc.) are to be locked in the office. Stepping Stone will not accept liability/responsibility for residents' personal belongs. Loss and/or damage to personal property is assumed by the resident.

6) Residents are required to sit down at the diner table for the evening meal and also participate in evening group sessions.

7) Visiting hours for guests: Monday through Friday - 2:00 p.m. to 5:00 p.m.
Saturday and Sunday - 12:00 noon to 6:00 p.m.
Parents and family members may visit at any reasonable time with prior counselor and youth notificaton.

8) The "Emergency Only - Do Not Disturb" sign on the office door means do not knock or open the door unless what you need absolutely cannot wait. Please be thoughtful when sessions are going on.

9) Every resident except the assigned cook must help clean up the dining room and kitchen after the evening meal.

10) Dishes and utensils must be washed by hand and then placed in the dishwasher or in the drainer no matter what time of the day. Do not leave them in the sink or elsewhere. This may result in entertainment ban.

11) No sleeping allowed during the day. The TV is not to be on during the day. After group sessions or dinner the TV may be on with the OK from the staff.

12) The radio must be kept at a level that does not interfere with the telephones or people's conversations. Do not blast the radio please. Violations will result in entertainment ban.

13) Evaluations must be completed before 7:00 p.m. It is your responsibility to ask staff to do it with you.

14) Washers and dryers are not to be used between 10:00 p.m. and 8:00 a.m.

AGREEMENT: I have read and understand these policies. I voluntarily will participate in the Stepping Stone program and agree to abide by the above policies while at the house.

____
Resident

____
Witness

6/87

____
Date

Courtesy of: Stepping Stone

House rules such as these of a California transitional living program help homeless adolescents develop the skills they need to live on their own.

runaway shelter, and 14 percent did not know where they would go. At least some of these adolescents probably chose to remain on the streets either because the alternatives they were offered (e.g, returning to live with an abusive parent or entering foster care environments) were not desirable to or appropriate for them; because desired alternatives (e.g., independent living) were not available to them; or because, given the lack of appropriate alternatives, they did not wish to leave the relative freedom of the streets and a supportive "community" of friends.

In one New Jersey study, one-third of adolescents receiving shelter services were able to return to their families after receiving services; another third went to foster care or a group home (58).

However, other studies have reported more positive results or effects of shelters. According to a report of the Los Angeles Task Force on Runaway and Homeless Adolescents, 70 percent of adolescents in Los Angeles County who received shelter services from October 1986 to September 1987 either returned to their families or went to other appropriate alternatives (e.g., foster care or independent living). Six months later, almost all of these adolescents (94 percent) were reported to have remained off the street (35).

A September 1983 report by GAO that assessed the role of runaway and homeless youth centers in reuniting families and resolving family conflicts, indicated that the great majority of adolescents who used their services (93 percent) and their parents (98 percent) believed that the services provided by the center had been helpful in resolving their family problems (64a).

Thus, while runaway and homeless youth shelter programs have proven to be extremely helpful to some adolescents, there are other adolescents for whom shelter services may not be adequate. The number of these adolescents is not known, but they seem likely to be those who are the most deeply troubled and for whom being reunited with a family is not a feasible option.

Missing Children's Assistance Act

In 1984, Congress passed the Missing Children's Assistance Act as Title IV of the Juvenile Justice and Delinquency Prevention Act (Public Law 98-473). The Missing Children's Assistance Act, which is administered by the Office of Juvenile Justice and Delinquency Prevention within the U.S. Department of Justice, authorizes Federal support for various activities designed to address issues related to the problem of missing children.

Programs funded under the Missing Children's Assistance Act include a national toll-free telephone line for reporting information on missing children, a national resource center and clearinghouse, and funding of various research projects on and programs for missing and exploited children. These programs are focused primarily toward missing children—i.e., children whose whereabouts are unknown to their legal custodian in circumstances that indicate that the child was removed without the consent of their legal guardian—or children at high risk of being abused or sexually exploited.

Although homeless children per se are not the primary focus of the Missing Children's Assistance Act, such children may be included as a focus for services if they fall under the definition of missing children as included in the Missing Children's Assistance Act. The interpretation of what constitutes risk of abuse remains ambiguous under the act (75). The mere fact that a minor is living on the street is not enough to warrant an expectation that he or she has a strong likelihood of being abused or sexually exploited. Furthermore, the need for actual evidence of such abuse increases as the child becomes older (67).

In 1987, the U.S. Department of Justice funded a study under the Missing Children's Assistance Act to develop reliable and valid national estimates of the numbers of missing children over the course of a year and to establish profiles of missing children. Runaways and thrownaways are included in the study, as are family-abducted children and non-family-abducted children (75).

Anti-Drug Abuse Act of 1988

The Anti-Drug Abuse Act of 1988 (Public Law 100-690) authorized $15 million for drug abuse treatment and prevention programs for homeless and runaway adolescents (ages not specified)—including peer counseling programs; individual, family, and group counseling; and community education activities.[40] This funding is available only when appropriations for the Runaway and Homeless Youth Act (see above) exceed the amount appropriated for the previous year.

Funding first became available in fiscal year 1989. Grants were awarded by the Administration of Children, Youth, and Families in DHHS to 104 organizations and agencies to address drug abuse problems among homeless and runaway adolescents (30).

Collaborative Efforts Among Federal Agencies

The Administration for Children, Youth, and Families, the agency in DHHS's Office of Human Development Services that administers the Runaway and Homeless Youth Act, has entered into collaborative arrangements with other Federal agencies to improve services to homeless adolescents. In fiscal year 1988, the Administration for Children, Youth, and Families signed a memorandum of understanding with the Public Health Service to facilitate the development of relationships between federally funded Health Care for the Homeless projects and runaway and homeless youth centers. The memorandum of understanding also includes a pilot program that enables medical students to volunteer their services in homeless and runaway youth centers.

The Administration for Children, Youth, and Families has also worked with the National Institute on Drug Abuse to develop an AIDS prevention curriculum for shelter staff. Training programs for shelter staff have now been initiated (30).

Conclusions and Policy Implications

DHHS estimated in 1984 (on the basis of data from a 1976 survey mandated by Congress) that there are as many as 1 million homeless and runaway adolescents ages 10 through 17 each year, and this estimate continues to be used.

Information about the causes and consequences of adolescent homelessness is limited.[41] Some homeless adolescents are homeless because their families are homeless; others are homeless on their own. Adolescents who are homeless with their families are likely to be homeless because of lack of available housing, limited economic resources, family crises (e.g., divorce or separation of parents or of an adolescent and his or her partner, loss of family source of income, eviction). Adolescents who are homeless on their own are more likely to be homeless because they have left dysfunctional families in which there are high levels of conflict, because they have been abused, because they themselves are suffering from mental disorders or other problems, or because they have left foster care or institutional settings (e.g., juvenile justice facilities or mental health institutions) without arrangements for stable housing.

Whether in families or on their own, homeless adolescents experience a broad range of physical, mental, and school problems. Homeless adolescents on their own have high rates of substance abuse, sexual activity (including prostitution), and delinquency. Sometimes these activities are used as survival strategies (e.g., exchange of sexual favors for food or a place to stay). There is anecdotal evidence that the population of young people on the street is becoming younger and more dysfunctional.

Little is known about the health, education, or other needs of homeless adolescents who do not use the existing runaway and homeless youth shelter system. Most of the research that has been done to date has relied heavily on adolescents sampled from shelters in urban areas and does not follow adolescents over time. As a consequence, very little is known about homeless adolescents who do not utilize shelter services (or even what proportion do use services) or about the characteristics and service needs of homeless adolescents in nonurban areas.

There is strong evidence, however, that homeless adolescents are at high risk for physical health problems (including pregnancy and sexually transmitted diseases), mental health problems, and substance abuse. They are also at high risk for social problems such as dropping out of school, lack of employment skills, and criminal and delinquent behavior.

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[40] For a general discussion of Federal policies pertaining to substance abuse among adolescents, see ch. 12, "Alcohol, Tobacco, and Drug Abuse: Prevention and Services," in this volume.

[41] DHHS, as required by the Stewart B. McKinney Homeless Assistance Act (Public Law 100-77), funded a study of the underlying causes of youth homelessness in 1988, and the results are expected in late 1991 (43a).

The approaches for preventing homelessness among adolescents vary, depending in part on whether adolescents are living with their families or are in foster care or institutions. Clearly, one possible strategy for preventing homelessness among adolescents living with their families would be to increase the Nation's supply of safe, affordable, accessible low-income housing. An additional strategy would be to support prevention, early identification, and supportive interventions to help resolve problems in dysfunctional families that contribute to adolescents' leaving home (e.g., parental substance abuse, physical or sexual abuse of a child, and family conflicts related to an adolescent's homosexuality). Adolescents living in foster care, group homes, or institutions such as State psychiatric hospitals or juvenile justice facilities are particularly important subjects for homelessness prevention programs. Unless they receive adequate preparation for independent living and developmentally appropriate supportive services, adolescents who leave these settings are at high risk of becoming homeless. The Federal Government provides grants to States to develop model "independent living" programs to facilitate adolescents' transition to independent living after leaving the foster care system (76). Even adolescents who participate in independent living programs, however, may need various types of social, economic, and emotional support before they can become independent (76).

Many adolescents who become homeless, whether with their families or on their own, have physical, mental health, or social problems prior to becoming homeless. Once they become homeless, these problems may worsen and their need for services is likely to increase. Studies indicate that homeless adolescents are at extremely high risk for a multiplicity of physical health problems (e.g., nutritional deficiencies, sexually transmitted diseases, problems related to physical or sexual abuse), mental health problems (e.g., depression, substance abuse), and school problems (e.g., dropout). Because these problems cut across traditional agency boundaries, homeless adolescents are likely to be best served by a system that offers a continuum of coordinated and comprehensive services.

Comprehensive, developmentally appropriate services for homeless adolescents are practically nonexistent in this country. Even safe shelter is not always available. At the Federal level, the needs of homeless adolescents have been addressed most directly through the limited funding of the Runaway and Homeless Youth Act, which helps fund runaway and homeless youth centers. These centers provide 15 days of emergency shelter to homeless and runaway adolescents and aim to reunite the adolescents with their families. Unfortunately, the number of beds available is far outstripped by the number of adolescents in need. Furthermore, for adolescents who have run away from or been thrown out of abusive or severely dysfunctional families, the goal of family reunification may not be appropriate; these adolescents need far more than 15 days of emergency shelter.

In addition to needing emergency shelter, many adolescents who are homeless, whether with their families or on their own, need safe permanent housing and a variety of health, educational, and social support services. In most communities, services for homeless adolescents are fragmented and inadequate. Thus, for example, few communities have a full range of mental health and substance abuse programs to serve homeless adolescents, and the lack of residential substance abuse treatment programs for homeless adolescents, particularly those without health insurance, has been frequently noted (41,60).[42] Another point that should be made is that many adolescents who are homeless on their own face legal barriers to obtaining housing or other services. If they have not been emancipated, they may not be able to sign a lease, obtain Federal income support and health insurance benefits, obtain medical care, or enroll in school without permission of a guardian.[43] Policies that would enable homeless adolescents to more easily obtain the services they need would reduce their risk for further problems (e.g., by increasing the chances that they may finish school, by ensuring that they get appropriate health care, by allowing them to secure safe housing).

As a group, homeless adolescents are in need of targeted education and employment training programs that offer a range of options, including flexible day labor and part-time work. As noted earlier, Congress recently changed the McKinney Homeless Assistance Act to require States to ensure access to public education for homeless adolescents. The responses of States to this requirement should be carefully monitored. Working adolescents who have not completed high school may need alternative school programs in order to complete school; other adolescents who have experienced disruptions in their education while homeless may need special "catch-up" programs. Because they are likely to have few marketable skills, particularly if they have not completed high school, homeless adolescents may also need employment preparation and training.

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[42] Most homeless adolescents have no health insurance. The effectiveness of substance abuse treatment for adolescents is discussed in ch. 12, "Alcohol, Tobacco, and Drug Abuse: Prevention and Services," in this volume.

[43] Legal emancipation is discussed in ch. 17, "Consent and Confidentiality in Adolescent Health Care Decisionmaking," in Vol. III.

Addressing the problems of homeless adolescents demands responses at the Federal, State, and local levels, and involvement of both the public and private sectors. Specific policy options related to the problems of runaway and homeless adolescents are listed in Volume I.

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APPENDIX

Appendix A
GLOSSARY OF ABBREVIATIONS AND TERMS

Abbreviations

AA —Alcoholics Anonymous
AAP —American Academy of Pediatrics
AAPT —Adolescent Alcohol Prevention Trial
ACS —American Cancer Society
ACYF —Administration on Children, Youth and Families (DHHS)
ADAMHA —Alcohol, Drug Abuse, and Mental Health Administration (PHS)
ADHD —attention deficit hyperactivity disorder
ADM —alcohol, drug abuse, and mental health (block grant)
AFDC —Aid to Families With Dependent Children (program)
AFL —Adolescent Family Life (program under Title XX of the Public Health Service Act)
AIDS —acquired immunodeficiency syndrome
ALERT —Adolescent Experiences in Resistance Training (program)
AMA —American Medical Association
AODA —alcoholism and/or drug abuse (counselor)
APA —American Psychiatric Association
APHA —American Public Health Association
ASAM —American Society of Addiction Medicine
ASHA —American School Health Association
ATV —all-terrain vehicle
AYI —Alaska Youth Initiative
BHCDA —Bureau of Health Care Delivery and Assistance (HRSA)
BIA —Bureau of Indian Affairs (U.S. Department of the Interior)
BMCH —Bureau of Maternal and Child Health (HRSA)
BMI —body mass index
BSST —behavioral social skills training
CASSP —Child and Adolescent Service System Program (NIMH)
CATOR —Chemical Abuse Treatment Outcome Research (network)
CBO —Congressional Budget Office (U.S. Congress)
CCC —Civilian Conservation Corps
CDC —Centers for Disease Control (PHS)
CFR —Code of Federal Regulations
CHC —community health center
CMHC —community mental health center
CPS —children's protective services
CPSC —Consumer Safety Product Commission
CRS —Congressional Research Service (Library of Congress)
CSFII —Continuing Surveys of Food Intakes by Individuals (USDA)
CVC —Civilian Volunteer Corps (New York City)
CWLA —Child Welfare League of America
DARE —Drug Abuse Resistance Education (project)
DARP —Drug Abuse Reporting Program
DAWN —Drug Abuse Warning Network (NIDA)
DDI —dideoxyinosine
DHEW —U.S. Department of Health, Education, and Welfare (now DHHS)
DHHS —U.S. Department of Health and Human Services
DHKS —Diet and Health Knowledge Survey (USDA)
DIEC —Division of Injury Epidemiology and Control (Centers for Disease Control)
DMCH —Department of Maternal and Child Health
DMFS —Decayed, Missing, or Filled Surfaces (of permanent teeth)
DMFT —Decayed, Missing, or Filled (permanent) Teeth
DOE —U.S. Department of Energy
DOT —U.S. Department of Transportation
DSM-III —*Diagnostic and Statistical Manual of Mental Disorders*, 3rd ed.
DSM-III-R —*Diagnostic and Statistical Manual of Mental Disorders*, 3rd ed., revised
EPSDT —Early and Periodic Screening, Diagnosis, and Treatment program (Medicaid)
ER —emergency room
FACES —Family Cohesion and Flexibility Scale
FBI —Federal Bureau of Investigation (U.S. Department of Justice)
FDA —Food and Drug Administration (PHS)
FR —Federal Register
GAO —General Accounting Office (U.S. Congress)
GED —tests of general educational development
GMENAC —Graduate Medical Education National Advisory Committee
HDL —high-density lipoprotein
Hispanic HANES —Hispanic Health and Nutrition Examination Survey (NCHS)
HIV —human immunodeficiency virus (AIDS virus)
HNIS —Human Nutrition Information Service (USDA)
HPV —human papillomavirus
HRSA —Health Resources and Services Administration (PHS)
HSV —herpes simplex virus
ICD-9-CM —International Classification of Diseases, 9th revision, Clinical Modification

ICPS —Interpersonal Cognitive Problem-Solving (program)
IHAD —I Have a Dream (program)
IND —investigational new drug
IOM —Institute of Medicine (NAS)
IQ —intelligence quotient
ISA-SPS —Improving-Social-Awareness/Social-Problem-Solving (program)
IV —intravenous
JOBS —Job Opportunities and Basic Skills (program)
LDL —low-density lipoprotein
LSC —Life Skills Counseling (program)
LSD —lysergic acid diethylamide
LST —Life Skills Training (program)
MCT —minimum competency test
MIT —Massachusetts Institute of Technology
MMPI —Minnesota Multi-Phasic Personality Inventory
MSA —Metropolitan Statistical Area
NAATP —National Association of Addiction Treatment Providers
NACHO —National Association of County Health Officials
NAMCS —National Ambulatory Medical Care Survey (NCHS)
NAPPH —National Association of Private Psychiatric Hospitals
NAS —National Academy of Sciences
NASHS —National Adolescent Student Health Survey
NCCAN —National Center on Child Abuse and Neglect (OHDS)
NCEMCH —National Center for Education in Maternal and Child Health (Georgetown University)
NCHS —National Center for Health Statistics (CDC)
NCI —National Cancer Institute (NIH)
NCYFS —National Children and Youth Fitness Study
NDATUS —National Drug and Alcoholism Treatment Unit Survey (ADAMHA)
NEISS —National Electronic Injury Surveillance System (CPSC)
NFCS —Nationwide Food Consumption Survey (USDA)
NHANES —National Health and Nutrition Examination Survey (NCHS)
NHDS —National Hospital Discharge Survey (NCHS)
NHES —National Health Examination Survey (NCHS)
NHIS —National Health Interview Survey (NCHS)
NHLBI —National Heart, Lung, and Blood Institute (NIH)
NHTSA —National Highway Transportation Safety Administration (U.S. Department of Transportation)
NIAAA —National Institute on Alcohol Abuse and Alcoholism (ADAMHA)
NICHD —National Institute of Child Health and Human Development (NIH)
NICHY —National Information Center for Children and Youth With Handicaps
NIDA —National Institute on Drug Abuse (ADAMHA)
NIDR —National Institute of Dental Research (NIH)
NIE —National Institute of Education
NIH —National Institutes of Health (PHS)
NIMH —National Institute of Mental Health (ADAMHA)
NLSY —National Longitudinal Survey of Labor Market Experience—Youth Cohort (U.S. Department of Labor)
NMCES —National Medical Care Expenditure Survey (Agency for Health Care Policy and Research, PHS)
NMCUES —National Medical Care Utilization and Expenditure Survey (NCHS)
NMHA —National Mental Health Association
NSFG —National Survey of Family Growth (NCHS)
OB-GYN —obstetrics-gynecology
ODPHP —Office of Disease Prevention and Health Promotion (DHHS)
OHDS —Office of Human Development Services (DHHS)
OHI-S —Simplified Oral Hygiene Index
OJJDP —Office of Juvenile Justice and Delinquency Prevention (U.S. Department of Justice)
ONCDP —Office of National Drug Control Programs (Executive Office of the President)
OSAP —Office for Substance Abuse Prevention (ADAMHA)
OSERS —Office of Special Education and Rehabilitative Services (U.S. Department of Education)
OTA —Office of Technology Assessment (U.S. Congress)
OTI —Office for Treatment Improvement (ADAMHA)
PCP —phencyclidine
PDAY —Pathological Determinants of Atherosclerosis in Youth
PHS —Public Health Service (DHHS)
PID —pelvic inflammatory disease
PRIDE —Parents' Resource Institute for Drug Education
PSI —Postponing Sexual Involvement (program)
RCT —randomized clinical trial
RDAs —recommended dietary allowance
RTC —residential treatment center
RTI —Research Triangle Institute
SEER —Surveillance, Epidemiology, and End Results Program (NCI)
SES —socioeconomic status
SLHC —school-linked health center

SMART	—Self Management and Resistance Training (program)
SPRANS	—special projects of regional and national significance (under Title V of the Social Security Act)
STAR	—Students Taught Awareness and Resistance (program)
STD	—sexually transmitted disease
STEP	—Summer Training and Education Program
SYETP	—Summer Youth Employment and Training Program (U.S. Department of Labor)
TAPP	—Teenage Pregnancy and Planning Program
THC	—tetrahydrocannabinol
TOP	—Teen Outreach Program
TOPS	—Treatment Outcome Prospective Study (Research Triangle Institute)
TPI	—Treatment Priority Index (for oral malocclusion)
USDA	—U.S. Department of Agriculture
VISTA	—Volunteers in Service to America (ACTION)
VLDL	—very low density lipoprotein
WHO	—World Health Organization
WIC	—Special Supplemental Food Program for Women, Infants, and Children (U.S. Department of Agriculture)
YMCA	—Young Men's Christian Association
YNH-SPS	—Yale-New Haven/Social-Problem-Solving (project)
YOU	—Youth Opportunity Unlimited (program)
YRBSS	—Youth Risk Behavioral Surveillance System (CDC)
YWCA	—Young Women's Christian Association

Terms

Abortion: Termination of pregnancy. In this Report, the term is generally used to refer to induced abortion rather than spontaneous fetal loss. In the United States, the methods most commonly used to terminate pregnancies are surgical (e.g., vacuum curettage, dilation and curettage, dilation and evacuation, hysterotomy, and hysterectomy). A nonsurgical medical method of abortion used in France—the administration of the compound RU-486 and prostaglandins—is not available in the United States.

Abortion rate: The number of abortions in a given population per some population base during a given time period (e.g., 43 abortions per 1,000 females ages 15 to 19 in a given year).

Abstinence from sexual activity: Refraining from sexual intercourse, one approach to the prevention of *sexually transmitted disease (STD), AIDS*, and pregnancy. Compare *contraception*.

Abuse: See *alcohol abuse, emotional abuse, physical abuse, psychoactive substance abuse, sexual abuse*.

Academic tracking: The separation of students into groups by achievement levels.

Access: Potential and actual entry of a population into the health care delivery system.

Accidental injury: An injury that is not self-inflicted or caused by *maltreatment* or other violence.

Acne: Common acne (acne vulgaris) is a chronic inflammatory disease of the pilosebaceous apparatus, with lesions occurring most frequently on the face, chest, and back. The cause is unknown, but it has been suggested that many factors, including certain foods, stress, hereditary factors, hormones, drugs, and bacteria play an etiologic role.

Acquired immunodeficiency syndrome (AIDS): See *AIDS*.

Activity limitation: Each person identified as having a *chronic condition* by the *National Health Interview Survey* conducted by DHHS is classified according to the extent to which his or her activities are limited because of the conditions as follows: 1) persons unable to carry on their major activity (for children 5 to 17, a person's major activity refers to school attendance; for individuals age 18 and over, it usually refers to a job, housework, or school attendance); 2) persons limited in the amount or kind of major activity performed; 3) persons not limited in major activity but otherwise limited; and 4) persons not limited in activity. See also *disability*.

Acute condition: Generally, an injury, an illness, or an impairment of limited duration. For purposes of the *National Health Interview Survey* conducted by DHHS, an acute condition is a physical or mental condition that has lasted less than 3 months, is not a condition that normally lasts more than 3 months (e.g., diabetes, arthritis), and is of sufficient consequence to have involved either at least one doctor visit or at least 1 day of restricted activity. Acute conditions experienced by U.S. adolescents include injuries, illnesses ranging from respiratory conditions such as colds and influenza, intestinal viruses, dermatitis, ear infections, dental problems, and some acute psychiatric conditions. Compare *chronic condition*.

Acute illness (physical, mental): For purposes of this Report, an acute illness is a disease or disorder (as opposed to an injury) of limited duration. The distinction between physical and mental illnesses is whether the illness is of the body or of the mind. This distinction is somewhat arbitrary, however, because some mental illnesses have a physiological base. See also *acute condition*.

Addiction model: A model of treatment for alcohol and drug abuse based on the philosophy that once a person has become a problem user of alcohol or drugs, he or she will always be a problem user and should avoid any use of alcohol and drugs for life.

Adjudicated: Passed on judicially, settled, or decreed, or convicted and sentenced. An adjudicated case is one in which the court has entered a judgment.

Adjustment disorder: A mental disorder defined in *DSM-III-R* as a maladaptive reaction to an identifiable psychosocial stressor or stressors that occurs within 3 months after the onset of the stressor and has persisted for no longer than 6 months. Adjustment disorder develops in reaction to a stressful event or series of events (e.g., discordant family relationships, parental divorce or death, illness, moving to a new place) and impairs ability to function in school or on the job, because the individual cannot cope with problems in an appropriate way and may become emotionally incapacitated by stress.

Adolescence: Definitions of adolescence vary, and many observers agree that a definition based on age alone is not sufficient. Adolescence typically takes place during the second decade of life, and is initiated by *puberty*, although physical and other changes occur (i.e., in height, weight, head size, facial structure, facial expression, and cognitive abilities). As used by OTA, adolescence most often refers to the period of life from ages 10 through 18.

Adolescent delinquency: Offenses committed by adolescents that would be considered violations of criminal law if committed by adults (ranging from minor ones such as disorderly conduct to serious ones such as aggravated assault) and offenses committed by adolescents that are considered offenses only because they are committed by a minor (i.e., "status offenses" such as running away from home, truancy).

Adolescent health: Narrow definitions of adolescent health might be the absence of physical disease and disability and the absence of engagement in health-compromising behaviors that lead to the so-called new morbidities (e.g., outcomes of sex, drug use, and violence). A broader definition would also include positive components of health (e.g., social competence); and health and well-being from the perspective of adolescents themselves (e.g., perceived quality of life). A fully realized view of adolescent health would also consider the impact of social (e.g., families, schools, communities, policies) and physical (e.g., fluoridation, automobile and highway design and construction) influences on health and would be sensitive to developmental changes that occur during adolescence. See also *health*.

Adrenal glands: Endocrine glands situated near the kidney that produce steroids like sex hormones, hormones related to metabolic functions, and adrenaline.

Adrenarche: Maturation of the adrenal glands, usually beginning between ages 6 and 8.

Advocacy (for adolescents): Refers to support, coordination, and linkage to experts, individuals, groups, and institutions who may help adolescents. It may be provided by parents or others known to an adolescents.

Affective disorder: Any disorder relating to, arising from, or influencing feelings or emotions, characterized by alterations in mood. See *mood disorders, anxiety disorders, depression.*

Aftercare: A variety of services designed to render assistance to an individual recovering from substance abuse following discharge from a hospital or formal treatment program, including such things as peer support and counseling, crisis services, job referral, and drop-in centers.

Aggravated assault: See *assault.*

AIDS (acquired immunodeficiency syndrome): A disease characterized by a deficiency of the immune system caused by *human immunodeficiency virus (HIV).* The primary defect in AIDS is an acquired, persistent, quantitative functional depression within the T4 subset of lymphocytes. This depression often leads to infections caused by micro-organisms that usually do not produce infections in individuals with normal immunity. HIV infection can be transmitted from one infected individual to another by means that include the sharing of a contaminated intravenous needle and engaging in *unprotected sexual intercourse* (i.e., intercourse without the use of condoms) with an infected person.

Aid to Families With Dependent Children (AFDC) program: A program, established by the Social Security Act of 1935, providing cash payments to needy children (and their caretakers) who lack support because at least one parent is dead, disabled, continually absent from the home, or unemployed. Eligible families must meet income and resource criteria specified by the State. See *Family Support Act of 1988.*

Alcohol (ethyl): One of the most commonly used of all *psychoactive substances*, alcohol is a transparent, colorless liquid, obtained by fermentation of carbohydrates with yeast. It is contained in beer, wine, and various other beverages (e.g., gin, whiskey).

Alcohol abuse: A form of *psychoactive substance abuse* that involves the substance ethyl alcohol.

Alcohol dependence: A form of *psychoactive substance dependence* that involves the substance ethyl alcohol.

Alcohol, Drug Abuse, and Mental Health (ADM) Block Grant Program: The major Federal program providing funds to States for outpatient alcohol, drug abuse, and mental health treatment programs. (Funds are not allowed to be used for *inpatient* services.) States receive a share of the ADM block grant appropriation through a formula based in part on the size of the State population (Subpart 1, part B of Title

XIX of the Public Health Service Act). The ADM Block Grant Program is administered by the Office of Treatment Improvement in the Alcohol, Drug Abuse, and Mental Health Administration in DHHS.

Ambulatory care: Medical services provided to patients who are not inpatients of hospitals. It includes outpatient hospital care.

Amenorrhea: Absence of menstrual bleeding.

American Indian or Alaska Native: A person having origins in any of the original peoples of North American and maintaining cultural identification through tribal affiliation or community recognition. Compare *black, white, Hispanic,* and *Asian or Pacific Islander.*

Amphetamines: A group of three closely related compounds, all of which are potent central nervous system and behavioral stimulants: 1) amphetamine, 2) methamphetamine, and 3) dextroamphetamine. Amphetamines are used medically to treat hyperactivity in children, mild brain dysfunction in children, narcolepsy (recurrent, uncontrollable, brief episodes of sleep), or mild depression.

Analgesics: Pain killers.

Androgens (also called androgenic hormones): Male sex hormones such as testosterone, which is responsible for inducing and maintaining secondary male sex characteristics.

Anemia: A condition that exists when the level of hemoglobin in a person's blood drops to an abnormally low level (e.g., below 11 grams per deciliter of whole blood).

Anorexia nervosa: See *eating disorders.*

Antisocial behaviors by children: Also known as conduct problems in the criminology literature, these are hostile or harmful behaviors that deviate from the social norm (e.g., aggression, stealing, lying, acting fighting).

Anxiety disorders: A set of disorders defined in *DSM-III-R* as disorders in which excessive apprehension, tension, or uneasiness that stems from the anticipation of internal or external danger is the primary symptom. This anxiety is manifested by physiological changes such as sweating, tremor, and rapid pulse. **Separation anxiety disorder** involves irrational fears or panic about being separated from those to whom one is attached, usually the parent(s). While separation anxiety disorder is more common among children, it may continue into adolescence.

Appetitive effects (of drugs): Usually pleasurable sensations or feelings, such as euphoria, which may instill a craving (or appetite) for continued use of a substance in order to prolong or re-create the desired effects.

Appropriation (by Congress): An act of Congress that authorizes one or more Federal agencies to incur obligations and make payments from the general fund or various special funds of the U.S. Treasury. Appropriations do not represent funds available in the Treasury but are limitations on the amounts that agencies may obligate during the time period set in the law. Compare *authorization.*

Arrest rate: The number of arrests made in a given population per some population base during a given time period (e.g., 5 arrests per 100,000 population). The arrest rate is analogous to an *incidence rate* for an offense.

Arson: See *serious property offenses.*

Asian or Pacific Islander: A person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands. The area includes China, India, Japan, Korea, the Philippine Islands, and Samoa. Compare *black, white, Hispanic,* and *American Indian or Alaska Native.*

Assault: The unlawful intentional inflicting, or attempted inflicting, of injury upon the person of another. **Simple assault** is the unlawful intentional inflicting of less than serious bodily injury without a deadly or dangerous weapon or an attempt or threat to inflict bodily injury without a deadly or dangerous weapon. **Aggravated assault** is the unlawful intentional inflicting of serious bodily injury or death by means of a deadly or dangerous weapon with or without actual infliction of injury.

Assertiveness training: Counseling for the purpose of improving interpersonal communications skills. Some programs focus on helping people to identify their own values; others communicate particular values and help people learn to live by them.

Asthma: Constriction of the bronchial tubes, producing wheezing and difficulty breathing, in response to irritation, allergy, or other stimuli.

Asymptomatic: Without symptoms.

Atherosclerotic cardiovascular disease: Heart disease related to a disorder of the arterial walls that includes degenerative changes, deposition of lipid, proliferation of smooth muscle cells, fibrosis, and calcification of the arterial walls.

Attention deficit hyperactivity disorder (ADHD): A mental disorder defined in *DSM-III-R* as a disturbance lasting at least 6 months that is characterized by developmentally inappropriate degrees of inattention, impulsiveness, and hyperactivity. The diagnosis is made when at least 8 of 14 specified criteria are met (e.g., often fidgets with hands or feet or feels restless, often talks excessively, often does not seem to be listening to what is being said). Onset of the disorder, which is more common in males than females, is typically before the age of 4 but must occur before age 7. Central nervous system abnormalities are thought to be predisposing factors. Some impairment in schoolwork or cooperating in group social activities is common.

Authoritative parenting: Parenting style that includes embracing traditional values, guiding children's activities firmly and consistently, stating values clearly, responding to children emotionally, providing a stimulating environment for children, and maintaining an appropriate ratio of children's autonomy to parental control at all times.

Authorization (by Congress): Substantive legislation that creates or continues a Federal agency or program for an indefinite or specified period of time. It may prescribe funding methods, allow a particular type of expenditure, or limit the level of budget authority. Compare *appropriation.*

AZT: See *zidovudine.*

Bacterium (pl., bacteria): Any of a group of one-celled micro-organisms having round, rodlike, spiral, or filamentous bodies that are enclosed by a cell wall or membrane and lack fully differentiated nuclei. Bacteria may exist as free-living organisms in soil, water, organic matter, or in the bodies of plants and animals. Some, but not all, bacteria can cause disease.

Barbiturates: A group of sedative-hypnotic compounds that are capable of producing all degrees of behavioral depression, ranging from mild sedation, through anesthesia, to coma and death. Barbiturates have traditionally been subclassified into compounds of varying durations of action. Many of the behavioral effects of the barbiturates are quite similar to those observed during alcohol-induced inebriation.

Bed-disability day: As defined by the National Health Interview Survey conducted by DHHS, any day on which person stays in bed for more than half of the daylight hours (or normal waking hours) because of an illness or an injury. All hospital days are bed-disability days. See also *restricted-activity day.*

Behavioral problems: Behavior that disturbs or harms the adolescent or others. Includes the mental health problems termed *disruptive behavior disorders* (e.g., attention deficit disorder, *conduct disorder*). See *problem behaviors.* Compare *physical problems* and *mood disorders.*

Bipolar or manic-depressive disorder: A mental disorder defined in *DSM-III-R* involving extreme swings in mood between severe depression and intense elation. During the manic phase, hyperactivity and a decreased need for sleep are common, as are an inflated sense of self-esteem and a lack of recognition that the behavior is not normal. These manic periods alternate with periods of depression, sometimes immediately following each other and sometimes with a period of normal moods between the manic and depressive phases.

Birth rate: A measure derived by dividing the number of live births in a population in a given period by the resident population at the middle of that period. It is expressed as the number of live births per 1,000 population. The rate may be restricted to births among women of a specific age, race, marital status, or other characteristic (e.g., 65 births per 1,000 females ages 15 to 19), or it may be related to the births among the entire population.

Black: A person having origins in any of the black racial groups in Africa. Normally excludes persons of Hispanic origin except for tabulations produced by the Bureau of the Census, which are noted accordingly. Compare *white, Hispanic, Asian or Pacific Islander, American Indian or Alaska Native.*

Block grants: Sums of Federal funds allotted to State agencies (e.g., education, health) which may be passed on to local agencies. States determine the mix of services provided and the population served and are accountable to the Federal Government only to the extent that funds are spent in accordance with program requirements. Sometimes, however, set-asides are required for specific population groups. See also names of specific block grant programs: *Alcohol, Drug Abuse, and Mental Health (ADM) Block Grant Program, Community Development Block Grant Program, Maternal and Child Health (MCH) Services Block Grant Program, Social Service Block Grant Program.*

Body mass index (BMI): Weight in kilograms divided by height in meters squared [m^2]. This is a measure used in determining *obesity* or *overweight.*

Bulimia nervosa: See *eating disorders.*

Burglary: See *serious property offenses.*

Calculus: A hard deposit of calcium phosphate and carbonate with organic matter on the surfaces of the teeth.

Cancer: A tumor with the potential for invading neighboring tissue and/or metastasizing to distant sites, or one that has already done so. Cancers are categorized into major classes by their cell types. A **carcinoma** is a cancer of the epithelia, including the external epithelia (mainly skin and linings of the gastrointestinal tract, lungs, and cervix) and the internal epithelia that line various glands (e.g., breast, pancreas, thyroid). A **sarcoma** is a tumor made up of a substance like the embryonic connective tissue; sarcomas are often highly malignant. See also *leukemia.*

Cannabis: The dried flower of the hemp plant, *Cannabis sativa,* that contains the *psychoactive substance* tetrahydrocannabinol (THC), which is the active ingredient in *marijuana* and *hashish.*

Career criminals: High rate and or long duration offenders who contribute most to total crime rates.

Central cities: The largest cities, with 50,000 or more inhabitants, in a *Metropolitan Statistical Area (MSA).* A smaller city within an MSA may qualify if it has at least 25,000 inhabitants or has a population of one-third or more of that of the largest city and a minimum population of 25,000. An exception occurs where two cities have contiguous boundaries and constitute, for economic and social purposes, a single community of at least 50,000, the smaller of which must have a population of at least 15,000.

Cerebral palsy: The popular term for a neurologic defect, typically present from infancy or childhood, that causes a major, but typically nonprogressive, disturbance of motor function. The term covers several diseases of widely differing etiologic and anatomic types.

Cervicitis: Inflammation of the cervix uteri (the neck of the uterus).

Chancre: 1) The usually painless primary lesion of syphilis, occurring at the site of entry of the infection, typically presenting as a small red papule or crusted erosion that breaks down to become round or oval, indurated, and slightly elevated with an eroded surface that exudes a serous fluid and gives rise to a nontender, firm regional lymphadenopathy (bubo); 2) any of various primary cutaneous lesions that are seen at the site of inoculation of infection in such diseases as herpes and tuberculosis.

Chancroid: A *sexually transmitted disease (STD)* caused by the bacterial agent *Haemophilus ducreyi* and characterized by a painful primary ulcer at the site of inoculation, usually on the external genitals. Potential complications include secondary infections, *fistulae*, and *paraphimosis* or *phimosis*.

Chapter 1 programs: Chapter 1, Title I of the Elementary and Secondary Education Act, provides Federal assistance for State and local educational programs for disadvantaged U.S. pupils from prekindergarten through secondary school.

Child and Adolescent Service System Program (CASSP): A small program, administered by the National Institute of Mental Health in DHHS, that was created by Congress in 1984 to promote greater coordination among public and private agencies providing services to children and adolescents with mental health problems.

Children's protective services: See *protective services*.

Child welfare services: See *social services*.

Child welfare system: See *social services*.

Chlamydial infection: Any *sexually transmitted disease (STD)* that is characterized by infection with the bacterial agent *Chlamydia trachomatis*. Such infection, which may be *asymptomatic* or accompanied by symptoms such as dysuria (difficult urination), penile or vaginal discharge, and urinary frequency, can potentially lead to complications that include urethral stricture, *urethritis*, *salpingitis*, *epididymitis*, infertility, and adverse obstetrical outcomes. Methods of prevention include the avoidance of multiple sexual partners. Treatment is with antibiotics. Chlamydia is the most common type of sexually transmitted disease among U.S. adolescents.

Cholesterol: A white, waxy, fat-like substance present in all of the body's tissues and in the bloodstream, essential to life. The cholesterol that comes from food (dietary cholesterol) is not an essential nutrient diet because sufficient amounts of cholesterol are produced in the body. Just how cholesterol is distributed through the body is not entirely clear, but, in simple terms, low-density *lipoproteins* (LDL) (the so-called "bad" cholesterol) appear to bring cholesterol into the system, and high-density lipoproteins (HDL) (the so-called "good" cholesterol) appear to carry cholesterol away from the system through the liver. Levels of cholesterol in the bloodstream can be affected by diet, and by genetic disorders, and diabetes and other metabolic diseases. Hypercholesterolemia (elevation of the blood cholesterol level) is thought to result by causing *atherosclerotic cardiovascular disease*.

Chronic condition: Generally, an illness, an injury, or an impairment that is lingering and lasting. For purposes of the *National Health Interview Survey* conducted by DHHS, a chronic condition is any physical or mental condition that either has lasted 3 months or more or is one of certain conditions that normally has a duration of more than 3 months (e.g., diabetes, arthritis). Compare *acute condition*.

Chronic illness (physical, mental): For purposes of this Report, a chronic illness is a disease or disorder (as opposed to an injury) that persists over an extended period of time. The distinction between physical and mental illnesses is somewhat arbitrary, however, because some mental illnesses have a physiological base. See also *chronic condition*. Compare *acute illness*.

Civilian noninstitutionalized population: The civilian population not residing in institutions. Institutions include correctional institutions, detention homes, and training schools for juvenile offenders, homes for dependent and neglected children, homes and schools for the mentally or physically handicapped, and homes for unwed mothers. This population is the denominator in rates calculated for the *National Ambulatory Medical Care Survey*, the *National Health and Nutrition Examination Survey*, and the *National Health Interview Survey*.

Cocaine: A *psychoactive substance* derived from coca leaves. Several types of coca preparations are used for their psychoactive properties: coca leaves (chewed), coca paste (smoked), cocaine hydrochloride powder (inhaled or injected), and cocaine alkaloid—"freebase" or "crack" (smoked).

Cocaine abuse: A form of *psychoactive substance abuse* that involves the substance cocaine.

Cocaine dependence: A form of *psychoactive substance dependence* that involves the substance cocaine.

Cognitive-behavioral skills training programs: Prevention and/or health promotion interventions that are based on the idea that problem behavior and emotional distress sometime result from an inability to develop and maintain positive social relationships due to deficits in social skills. Interpersonal cognitive problemsolving programs focus on processes such as interpreting social cues and others' intentions, generating alternative solutions, and means-ends thinking. Behavioral social skills training interventions focus on teaching specific behaviors such as entering a peer group, accepting criticism, giving compliments and resisting peer pressure. Many programs incorporate aspects of both types of training, often as a part of a school curriculum and done in small groups of students.

Comer's School Development Program: An educational intervention, developed by Yale child psychiatrist James Comer, that seeks to overcome "the sociocultural misalignment between home and school" that Comer believes underlies the academic and disciplinary problems of many school serving low-income black and ethnic minority students.

Community Development Block Grant Program: A Federal program of *block grants* to States and local communities established by Title I of the Housing and Community Development Act of 1974, as amended. The program provides Federal financial assistance to State and local governments to be used to fund a wide range of activities designed to further one of three national objectives: 1) benefit low- and moderate-income persons, 2) prevent or eliminate slums and blight, or 3) address an urgent community development problem that threatens the safety and health of the community. The 1974 act, as amended, identifies 19 categories of activities that may receive funding, including housing rehabilitation, historic preservation, economic development, public works, relocation assistance, public services, energy conservation, and property acquisition and demolition. Public works, housing rehabilitation, and economic development are the activities most often funded.

Community health center (CHC): An organization that provides primary health care and other health-related services to individuals in the local community. As of 1989, there were about 1,200 community health centers providing services at more than 2,000 sites throughout the country. Roughly half of these centers were receiving Federal grants under Section 330 of the Public Health Service Act, which authorizes grants to public and private nonprofit organizations that provide primary health care to populations or areas that are "medically underserved."

Community mental health centers (CMHCs): Local organizations that provide outpatient *mental health services* for people of all ages who have mental and emotional problems. There is no agreement about which organizations should be counted as CMHCs. Since 1981, with the advent of the Federal *Alcohol, Drug Abuse, and Mental Health (ADM) Block Grant Program*, the changes in the definition of CMHCs, and the discontinuation of CMHC monitoring by the National Institute of Mental Health in DHHS, organizations formerly classified as CMHCs have been reclassified as other types of organizations (e.g., *multiservice mental health organizations, freestanding psychiatric outpatient clinics*). Currently, CMHCs are funded in various ways, including fees, *third-party payment*, and State and local government contracts. Some CMHCs receive Federal ADM block grant funds.

Comorbidity: The occurrence of a health condition along with another health condition.

Comparison group: In evaluation research, a group that does not receive the "experimental" intervention or program, but receives no or a different intervention.

Comprehensive services for adolescents: The elements of comprehensive health and related services for adolescents are not entirely agreed upon. They include, at a minimum, care for acute physical illnesses, general medical examinations in preparation for involvement in athletics, mental health counseling, laboratory tests, *reproductive health care, family counseling*, prescriptions, *advocacy*, and coordination of care; the more comprehensive may include educational services, vocational services, legal assistance, recreational opportunities, and child care services and parenting education for adolescent parents.

Condition: As defined for purposes of the *National Health Interview Survey* conducted by DHHS, a departure from a state of physical or mental well-being. A health condition may be an *injury, an illness, or an impairment*. See also *acute condition, chronic condition*.

Condom: A sheath commonly made of rubber worn over the penis for the purpose of preventing pregnancy or preventing the transmission of *human immunodeficiency virus (HIV)* or particular types of *sexually transmitted diseases (STDs)*.

Conduct disorder: A mental disorder defined in *DSM-III-R* as a disturbance lasting at least 6 months in which a young person persistently violates the basic rights of others and violates major age-appropriate societal norms or rules. The diagnosis is made when at least 3 of 13 specified criteria are met (e.g., stealing, running away, frequent lying, deliberate fire-setting, frequent truancy, breaking into someone else's property, deliberately destroying property, being physically cruel to animals, using a weapon in more than one fight). Onset is usually prepubertal. Predisposing factors thought to be antecedent are *attention deficit hyperactivity disorder (ADHD)*, parental rejection, early institutional living, frequent shifting of parental figures, absence of a father or presence of a father with alcohol dependence, large family size, and association with a delinquent subgroup. Complications include school suspension, legal difficulties, *psychoactive substance* use disorders, high rates of injury from fights, unwanted pregnancy, and suicidal behavior. Compare *delinquent acts by adolescents.*

Condyloma acuminatum: A *sexually transmitted disease (STD)* characterized by warty lesions on the mucous membrane or skin of the external genitals or in the perianal region and caused by human papillomavirus (HPV).

Continuing Survey of Food Intakes by Individuals (CSFII): A household survey, conducted by the Food and Nutrition Service of the U.S. Department of Agriculture since 1985, that is designed to measure levels and changes in the food and nutrient content and nutritional adequacy of U.S. diets on a continuing basis.

Contraception: In this Report, the use of methods other than *abstinence from sexual activity* to prevent pregnancy. See *contraceptives or contraceptive methods.*

Contraceptives or contraceptive methods: Methods of preventing pregnancy other than *abstinence from sexual activity.* Such methods include periodic abstinence (rhythm method); control of ejaculation (coitus interruptus); the use of spermicidal chemicals in jellies or creams; mechanical barriers (e.g., condoms, caps, or diaphragms); prevention of implantation (e.g., intrauterine device); the use of synthetic hormones to control the female reproductive cycle; and sterilization of the male or female partner. Various methods vary in terms of their effectiveness in preventing pregnancy, their side effects, and their noncontraceptive benefits such as protection from *sexually transmitted diseases (STDs).* See also *condoms, diaphragm, oral contraceptives,* and *spermicides.*

Control group: In a randomized clinical trial or other *experimental design*, the group receiving no treatment or some treatment with which the group receiving experimental treatment is compared. The control treatment is generally a standard treatment, a placebo, or no treatment. Compare *experimental group.*

Cooperative learning interventions: Interventions in schools that involve putting students together in groups where they need to work together to create a final product. Cooperative learning enables heterogeneous groups of students to work across ability levels; encourages students to participate actively as teachers and as learners with their peers; and facilitates empathy across and within racial, ethnic and ability groups; and shifts the questions of absolute authority away from teachers.

Correlation coefficient: Percentage of interdependence between two variables. When a change in one variable is accompanied by a change in the second variable in the same direction, the correlation is positive; if the second variable changes, but in direction opposite to that of the first, the correlation is negative.

Covariation: The tendency of health problems to occur in the same individual at approximately the same time. The problems may have a single common cause, or one problem may be the cause of another.

Crack cocaine: See *cocaine.*

Crimes: Infractions of the law by adults.

Crisis intervention: Therapeutic techniques for individuals who are experiencing a crisis.

Cross-sectional studies: Studies involving samples representative of the entire population. In criminology research, studies that compare individuals involved in offending behavior with those who do not commit offenses at one point in time.

Cystic fibrosis: An autosomal recessive disorder caused by the production of a unique glycoprotein that results in abnormal mucous secretions. It is one of the most common genetic diseases in caucasian children, and is most often seen in children and young adults. It is usually fatal before age 20. Death is due to excess mucus in the lungs and to pancreatic insufficiency.

Day treatment: See *partial hospitalization/day treatment.*

Death rate: See *mortality rate.*

Decisionmaking skills: Skills relevant to the ability to make rational, health-promoting decisions about one's life. Often a part of *life skills training* interventions.

Delinquent acts by adolescents: Two broad categories of acts committed by adolescents: 1) acts that would be considered crimes if committed by an adult (ranging from minor offenses such as disorderly conduct to serious offenses such as aggravated assault); and 2) status offenses, which are considered offenses only when committed by minors (e.g., running away from home, truancy). See also *minor offenses, serious property offenses, serious violent offenses.* Compare *conduct disorder.*

Delinquent adolescent: An adolescent who has either violated Federal, State, municipal, or local criminal laws or has committed *status offenses* (e.g., running away from home, truancy).

Demand reduction substance use prevention strategies: Strategies related to the prevention of drug use and abuse that involve changing behavior through education (of individuals or of society as a whole), through providing alternatives to alcohol and other drug use, and through community action to change the social or physical environment that supports the undesirable behavior. Compare *supply reduction substance use prevention strategies.*

Demographic factors: Age, gender, race, ethnicity, geographic location and socioeconomic status are typically defined as demographic factors.

Dental and oral health: The term dental means of or relating to the teeth or dentistry (the health profession that cares for teeth); and the term oral means of or relating to all aspects of the oral cavity (e.g., the gums and the tongue). Thus, dental and oral health refers to the health of these structures.

Dental caries: The localized, progressive decay of a tooth, starting on the surface, and if untreated, extending to the inner tooth chamber and resulting in infection.

Dental sealants: Thin coatings of plastic material placed on the occlusal (chewing) surfaces of posterior teeth to prevent the accumulation of food debris and bacteria in the pits and fissures of these teeth and subsequent dental decay.

Depression: A psychiatric syndrome defined in *DSM-III-R* that involves dejected mood and often poor sleep and weight loss. Depression may have genetic and biochemical components. Antidepressant drugs seem to act by affecting neurotransmitters in the brain. See also *bipolar disorder*, *dysthymia*.

Designer drugs: Structural analogs of substances scheduled under the Controlled Substances Act that are prepared to mimic the psychoactive effects of controlled drugs. Because the analogs are not structurally identical to their parent compound, their manufacture and distribution is not a violation of the Controlled Substances Act.

Detoxification: The recovery, or the process of bringing about the recovery, of a patient from a state of dependence on alcohol or other drug. **Medical detoxification** is the use of medication under the supervision of medical personnel to systematically reduce or eliminate the effects of alcohol in the body in a hospital or other 24-hour facility. **Social detoxification** is to systematically reduce or eliminate the effects of alcohol in the body on a drug-free basis, in a specialized nonmedical facility by trained medical personnel with physician services available when required. **Drug detoxification** is the period of planned withdrawal from drug dependency supported by the use of a prescribed medication (e.g., methadone).

Development: A process of growth and differentiation by successive changes. In humans, includes *physiological* development; cognitive development (increasing ability to think critically and engage in higher order reasoning); ego development (qualitatively different psychosocial stages, including internalization of the rules of social intercourse, increasing cognitive complexity and tolerance of ambiguity, and growing objectivity); and moral development (changes in the ability to recognize and reason about moral dilemmas and to make choices based on moral principles and reasoning).

Developmental disabilities: Most broadly, any disability that interferes with normal human *development*. As defined by the Developmental Disabilities Assistance and Bill of Rights Act, the definition is based on functional limitations rather than specific disorders. These limitations must be manifest before age 22; be attributable to a mental or physical impairment; and result in substantial limitations in three or more major life activities, such as self-care, learning, receptive, and expressive language, and mobility. See also *developmental disorders*.

Developmental disorders: A group of mental disorders defined in *DSM-III-R* as disorders in which the predominant disturbance is in the acquisition of cognitive, language, motor, or social skills. The course of developmental disorders tends to be chronic, with some signs of the disorder persisting in a stable form (without periods of remission or exacerbation into adult life).

Developmentally appropriate: Health promotion, prevention, and treatment services and environments designed so that they fit the emotional, behavioral/experiential, and intellectual levels of the individual who is to benefit from the service. Because of the asynchronous development within even individual adolescents (as well as individuals in other age categories), designing programs so that they are developmentally appropriate is a distinct challenge.

Diabetes (diabetes mellitus): A chronic metabolic disorder characterized by an inappropriate elevation of blood glucose level, and impaired fat and protein metabolism, for which a relative or absolute lack of insulin is responsible. It occurs in two forms: insulin-dependent diabetes mellitus (type I) for which the peak age of onset is age 14, and non-insulin-dependent diabetes (type II) for which the peak age of onset is age 50 to 60. Both types are associated with disease of small and large blood vessels.

Diagnosable mental disorders: Disorders included in the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders*, 3rd ed., revised (DSM-III-R) or in the *International Classification of Diseases*, 9th revision, Clinical Modification (ICD-9-CM).

Diagnostic and Statistical Manual of Mental Disorders, 3rd ed., revised: See *DSM-III-R*.

Diaphragm: A prescription *contraceptive method* that involves the insertion of a dome-shaped rubber cap with a flexible rim into the vagina prior to intercourse. Spermicidal cream or jelly is placed in the dome before insertion. The diaphragm and *spermicide* combination probably provides some protection against *sexually transmitted disease (STD)*, including *pelvic inflammatory disease (PID)*.

Dideoxyonosine (DDI): A drug used for some patients with *human immunodeficiency virus (HIV)* infection or *AIDS*. Also called didanosine.

Diet and Health Knowledge Survey (DHKS): A survey begun by the U.S. Department of Agriculture in 1989 as a followup to the *Continuing Survey of Food Intakes by Individuals (CSFII)*. DHKS targets food managers participating in CSFII and seeks to link individuals' knowledge and attitudes about diet and health to their actual behavior.

Disability: A term used to denote the presence of one or more functional limitations. As defined by DHHS' National Center for Health Statistics, a disability is a temporary or long-term reduction of a person's activity as a result of an *acute* or *chronic condition.* Disabilities may be caused by illnesses, injuries, or impairments. They are measured by the number of days that a person's activity has been reduced or by a person's degree of ability to carry on the major activity for his/her age group (for children 5 to 17, major activity refers to school attendance). Compare *handicap* and *impairment.*

Discretionary time: That portion of time during which individuals are not engaged in mandatory or maintenance activities (e.g., school, work, sleeping, eating).

Disease: Any deviation from or interruption of the normal structure of function of any part, organ, or system (or combination thereof) of the body that is manifested by a characteristic set of symptoms and signs and whose etiology, pathology, and prognosis may be known or unknown. Compare *injury.* See *conditions.*

Disruptive behavior disorders: The three primary behavior disorders in *DSM-III-R* that are of concern during adolescence are *attention deficit hyperactivity disorder (ADHD), oppositional defiant disorder,* and *conduct disorder.*

Diversion programs (for adolescent juvenile offenders): Programs that seek to limit juvenile offenders' involvement with the *juvenile justice system* by diverting such offenders from the courts and juvenile justice facilities to other social control institutions (e.g., the family, schools, social service programs).

DMFS index: An index used to measure the average number per person in a specified population of *D*ecayed permanent tooth surfaces, *M*issing permanent teeth, and *F*illed (or restored) *S*urfaces of permanent teeth. It is a somewhat more sensitive measure of dental caries than the *DMFT index.*

DMFT index: An index used to measure the average number per person in a specified population of *D*ecayed permanent teeth, *M*issing permanent teeth, and *F*illed permanent *T*eeth.

Down syndrome: A congenital syndrome characterized by moderate to severe mental retardation, congenital onset of growth failure, facial abnormalities including slanted eyes, congenital heart disease, and acute leukemia. It is caused by an extra chromosome and is associated with advanced maternal age at conception.

Dropout rate: School dropout rates can be defined in several ways. In this Report, the dropout rate used is the **status dropout rate**, or the proportion of a particular group of individuals (usually an age cohort) who are not enrolled in school and have not finished high school at a particular point in time. Other types of dropout rates include the *event dropout rate* (the share of students who leave school without completing high school in a single year) and the *cohort dropout rate* (the proportion of a group of students that drop out over time).

Drug: Strictly speaking, a drug is any chemical or biological substance other than food that may be used to affect the structure or function of the body. In this Report, however, the term drug generally refers to *psychoactive substances* with the potential for dependence or abuse. Sometimes the term is used more narrowly in this Report to refer to *illicit drugs* (i.e., drugs other than alcohol or tobacco, which are legally available to adults).

Drug abuse: See *psychoactive substance abuse.* In the *Drug Abuse Warning Network (DAWN)* of the National Institute on Drug Abuse, drug abuse is defined as "the nonmedical use of a substance for. . .psychic effect, dependence, or suicide attempt/gesture."

Drug abuse violations: As defined in the Federal Bureau of Investigation's Uniform Crime Reports, State and local offenses related to the unlawful possession, sale, use, growing, and manufacture of *narcotic* drugs.

Drug Abuse Warning Network (DAWN): A system that collects data on emergency room visits and deaths related to drug use from a sample of hospital emergency rooms and medical examiner facilities that report data for each "drug abuse" patient or death encountered by medical examiners. The DAWN system is designed primarily as an early warning system to monitor drug abuse patterns and health hazards associated with drug use and to detect new abuse entities and new combinations. The system is maintained by the National Institute on Drug Abuse in DHHS.

Drug demand reduction: See *demand reduction substance use prevention strategies.*

Drug dependence: See *psychoactive substance dependence.*

Drug supply reduction: See *supply reduction substance use prevention strategies.*

DSM-III-R (Diagnostic and Statistical Manual of Mental Disorders, 3rd ed., revised): A manual compiled by the American Psychiatric Association that includes a system for classifying mental disorders of children, adolescents, and adults.

Dysfunctional families: Families that lack cohesion and mutual support within a framework of affection that respects individual differences and the need for personal expression of autonomy. Such families may either stifle individuality or use inappropriate means of expressing such individuality (conflict and confrontation).

Dysmenorrhea: Painful menstruation. **Essential (or primary) dysmenorrhea** is painful menstruation for which there is no demonstrable cause. Other types of dysmenorrhea are caused by spasmodic uterine contractions, psychic disturbances, pelvic lesions, or other problems.

Dysthymia or depressive neurosis: A chronic *mood disorder* defined in *DSM-III-R* as a disorder in which an individual is depressed during at least a 2-year period the majority of the time. Associated symptoms are poor appetite or overeating, insomnia or hypersomnia, fatigue, low self-esteem, and feelings of hopelessness.

Early adolescence: A period encompassing the profound physical and social changes that occur with puberty, as maturation begins and social interactions become increasingly focused on sex (e.g., on members of the opposite sex). Typically takes place from ages 10 through 14. Compare *middle adolescence, late adolescence, younger adolescents, older adolescents.*

Eating disorders: A set of mental disorders defined in *DSM-III-R* as being characterized by gross disturbances in eating behavior. Eating disorders in adolescence primarily include anorexia nervosa and bulimia nervosa. **Anorexia nervosa** is defined by *DSM-III-R* as a disorder whose essential features are refusal to maintain body weight over a minimal normal weight for age and height, intense fear of gaining weight or becoming fat, even though underweight, a distorted body image, and amenorrhea (in females). **Bulimia nervosa** is defined by *DSM-III-R* as a disorder whose essential features are recurrent episodes of binge eating; a feeling of lack of control over eating behavior during the eating binges; self-induced vomiting, use of laxatives or diuretics, strict dieting or fasting, or vigorous exercise to prevent weight gain; and persistent overconcern with body shape and weight. Death is less likely for bulimics than for anorexics, but physical health problems are common for both groups.

Ectopic pregnancy: A pregnancy that is located away from normal position.

Education for All Handicapped Children Act (Public Law 94-142): A Federal law that mandates that all physically and mentally handicapped children be provided a free, appropriate education and the "related services" necessary to obtain an education. The Federal Government provides a small amount of grant money to States to help them implement this law.

Educational neglect: As defined by DHHS's National Center on Child Abuse and Neglect, educational neglect can take several forms: permitted chronic truancy, failure to enroll a school-aged child in school, causing the child to miss school for nonlegitimate reasons, and inattention to special educational need (e.g., refusal to allow or failure to obtain recommended remedial educational services).

Elementary school: A school classified as elementary by State and local practice and composed of any span of grades not above grade 8. A preschool or kindergarten school is included under this heading only if it is an integral part of an elementary school or a regularly established school system.

Emancipated minor: A minor who has been legally freed from the control and authority of his or her parents.

Emotional abuse: As defined by DHHS's National Center on Child Abuse and Neglect, emotional abuse takes three different forms: close confinement, such as tying or binding, or other tortuous restriction of movement; verbal or emotional assault (e.g., habitual patterns of belittling, denigrating, or scapegoating); and other overtly punitive, exploitative, or abusive treatment other than those specified under other forms of abuse (e.g., deliberate withholding of food).

Emotional neglect: As defined by DHHS's National Center on Child Abuse and Neglect, emotional neglect can take several forms: inadequate nurturance and affection; chronic or extreme spouse abuse in the child's presence; encouragement or permitting of drug or alcohol use by the child; permitting other maladaptive behavior; refusal of recommended, needed, and available psychological care; delay in psychological care; and other emotional neglect (e.g., other inattention to the child's developmental/emotional needs not classifiable under any of the above forms of emotional neglect, such as inappropriate application of expectations or restrictions).

Emotional problems: The mental health problems exhibited in the form of emotional distress (e.g., *anxiety* and other *mood disorders*); may include *subjective distress*. Compare *behavioral problems, physical problems.*

Endometriosis: The presence of functional endometrial glands or stroma or both outside the uterus, in sites including the ovaries, broad ligaments, rectovaginal septum, and umbilicus. The endometrial glands respond to hormonal stimuli, resulting in menstrual bleeding and cystic blood accumulations in these sites. Painful *menses* and pelvic pain are the main symptoms.

Epididymitis: Inflammation of the epididymis, the elongated cordlike structure along the posterior border of the testis, whose elongated coiled duct provides for the storage, transit, and maturation of spermatozoa.

Estrogen: Steroid hormones synthesized and secreted by the ovarian follicle, the fetoplacental unit, the testis, or the adrenal cortex. The biologic properties include induction of estrus (the period of receptivity to mating that occurs prior to ovulation), growth and maturation of the female secondary sex characters, and preparation of the womb for a fertilized ovum. Estrogens are widely used as components of oral contraceptives.

Ethnicity: A term used to indicate national origin (e.g., Hispanic, Asian). Most ethnic-specific census and health status information is available only for individuals of *Hispanic* origin. Compare *race.*

Experimental design: Strictly speaking, a research design in which research participants are randomly assigned to one or more *experimental groups* or one or more *control* or *comparison groups*. Compare *quasi-experimental design*.

Experimental group: In a randomized clinical trial, the group receiving the treatment being evaluated for safety and efficacy. The experimental treatment may be a new technology, an existing technology applied to a new problem, or an accepted treatment about whose safety or efficacy there is doubt. Compare *control group*.

Extracurricular activities: Activities that are not part of the required school curriculum and that take place outside of the regular course of study. Examples are school-sponsored varsity athletics, drama, and debate clubs.

Family: As defined by the U.S. Department of Commerce, Bureau of the Census, a group of two persons or more, one of whom is the *householder*, related by birth, marriage, or adoption and residing together. Also see *family household, household*.

Family communication programs: Programs that seek to prevent or delay early sexual activity among young adolescents by improving parent-child communication.

Family counseling: Counseling proivided to an entire family rather than solely to an individual.

Family household: As defined by the U.S. Department of Commerce, Bureau of the Census, a *household* maintained by a *family*; in addition, any *unrelated persons* who may be residing there are included in the count of household members.

Family income: For purposes of the *National Health Interview Survey* and *National Health and Nutrition Examination Survey*, all people within a household related to each other by blood, marriage, or adoption constitute a family.

Family life education: Ideally, a curriculum, program, or framework for helping young people make responsible choices and decisions by providing accurate and age-appropriate information about human sexuality, and by exploring the attitudes, behaviors, and value systems that shape the development of healthy sexuality. May include teaching of skills in communication, responsible decisionmaking, and assertiveness. See *life skills training*. Family life education is the more current and encompassing term for programs formerly, and now sometimes, known as *sex education*.

Family planning programs authorized by Title X of the Public Health Service Act: Title X, established by the Family Planning Services and Population Research Act of 1970, funds public or private nonprofit entities that operate voluntary family planning projects; funds training for personnel to improve the delivery of family planning services; promotes service delivery improvement through research; and develops and disseminates information on family planning. Contraceptives may be distributed without parental consent or notification, but the use of Title X funds for abortion as a method of family planning has been prohibited by statute and regulations. Low-income individuals are targeted as a priority group for receiving services. Although projects funded by Title X do not focus exclusively on adolescents, they are required to offer a broad range of family planning services to all who want them, including adolescents.

Family planning services: A range of services intended to help individuals plan when to have children, which typically include birth control information and counseling, provision of *contraceptives*, pregnancy testing and counseling, gynecological examinations, and referrals for related services. Such services are available through a variety of public and health providers that include *Title X family planning clinics* as well as more general health services settings.

Family Support Act of 1988 (Public Law 100-485): A major welfare reform bill that made changes in the *Aid to Families With Dependent Children (AFDC)* income support program and required States to implement by October 1, 1990, a *Job Opportunity and Basic Skills (JOBS) Program*. This act also required that, beginning October 1, 1990, all States provide AFDC and *Medicaid* coverage to families whose principal wage-earner is unemployed. Coverage under this provision is limited, however, to 6 months out of any 12-month period.

Family support interventions: A broad array of social support services provided to families, including day care, medical care, counseling, family needs assessment, and referrals to other social service agencies.

Federally funded runaway and homeless youth centers: Locally controlled facilities that receive Federal funds under the Federal Runaway and Homeless Youth Act (Title III of the Juvenile Justice and Delinquency Prevention Act) administered by the Administration for Children, Youth, and Families within the Office of Human Development Services of DHHS as well as other funds. In fiscal year 1987, there were 307 federally funded runaway and homeless youth centers throughout the country. Federally funded runaway and homeless youth centers provide emergency shelter (for up to 15 days), counseling, and other services to runaway or otherwise homeless youth.

Federal poverty level: The official U.S. Government definition of poverty based on cash income levels for families of different sizes. Responsibility for changing poverty concepts and definitions rests with the Office of Management and Budget.

Financial access (to health services): In this Report, used to refer to aspects of access that have to do with health insurance coverage and ability to pay for services. Compare *legal access*.

Firearm: A weapon from which a shot is discharged by gunpowder. The term firearm is usually used only of small arms. The term firearms includes guns (defined as portable firearms).

First-listed diagnosis: In the *National Hospital Discharge Survey* conducted by DHHS, this is the diagnosis listed first on the face sheet of a patient's medical record.

Fistulae: Abnormal passages leading from an abscess or hollow organ to the body surface or from one hollow organ to another and permitting passage of fluids or secretions.

Fluoridation: The addition of a minute quantity of a fluoride (usually one part per million of fluoride ion) to drinking water supplies in order to protect growing children against *dental caries*. Fluoride can also be applied topically (in toothpaste and rinses).

Food Stamp Program: A program of food assistance to low-income individuals that is administered by the U.S. Department of Agriculture's Food and Nutrition Service. Adolescents ages 15 to 17 make up an estimated 34 percent of the participants in the Food Stamp Program.

Forcible rape: See *serious violent offenses*.

Foster care: In its broadest sense, the placement of children in foster family homes, group homes, group child care facilities and *residential treatment centers* by the *child welfare system*. Most children in foster care are placed in foster family homes, that is, with a foster parent or parents and the parents' own or other foster children. Children and adolescents placed in foster care have been removed from their homes because of abuse, neglect, or abandonment, and they have either been adjudicated "dependent" by the courts or voluntarily placed in foster care by their families. Compare *therapeutic foster care*.

Freestanding psychiatric outpatient clinic: An administratively distinct organization that is not part of another organization (e.g., a hospital) that has as a primary purpose the provision of only ambulatory mental health services on either a regular or emergency basis. The medical responsibility for all patients/clients and/or direction of the mental health program is generally assumed by a psychiatrist.

Freestanding psychiatric partial care organization: An administratively distinct organization that is not part of another psychiatric organization (e.g., a hospital). It is comprised of programs for *ambulatory* patients who generally require more time (3 or more hours) than that provided through an *outpatient* visit, but who require less than 24-hour care. Compare *partial hospitalization/day treatment*.

General educational development (GED) program: Academic instruction to prepare persons to take the high school equivalency examination.

General hospital with separate psychiatric organization: A non-Federal hospital that routinely admits patients to a separate psychiatric service (e.g., inpatient, outpatient, or partial hospitalization), for the express purpose of diagnosing and treating psychiatric illness. A separate psychiatric unit is an organizational or administrative entity within a general hospital that provides one or more treatments or other clinical services for patients with a known or suspected psychiatric diagnosis.

Genital herpes: See *herpes genitalis*.

Glucose: A sugar found in certain foodstuffs (especially fruits) and in the normal blood of humans and other animals. It is the end product of carbohydrate metabolism and is the chief source of energy for living organisms, its utilization being controlled by insulin.

Gonadarche: Maturation of the reproductive organs.

Gonadotropins: Hormones that act upon the gonads.

Gonorrhea: A *sexually transmitted disease (STD)* characterized by infection with the bacterial agent *Neisseria gonorrhoeae*. Gonorrhea, which may be *asymptomatic* or accompanied by vaginal/penile discharge, abdominal pain, or other symptoms, can potentially lead to complications that include disseminated gonococcal infection (e.g., septicemia), *pelvic inflammatory disease (PID)*, *epididymitis*, and infertility or sterility. *Spermicides* and *condoms* offer some protection from this disease. Treatment is with antibiotics. Gonorrhea is the second most common type of sexually transmitted disease among U.S. adolescents.

Hallucinogens (psychedelics): A group of heterogeneous compounds that affect a person's perceptions, sensations, thinking, self-awareness, and emotions. Some hallucinogens come from natural sources (e.g., mescaline from peyote); others (e.g., LSD) are manufactured. Some surveys (including the *NIDA Household Survey on Drug Abuse*) consider *phencyclidine* (*PCP*) a hallucinogen because it has some of the same effects.

Handicap: As defined by OTA in 1982, the inability to perform one or more life functions (e.g., eating, conversing, working, attending school) at a "typical" level, caused by the interaction of an individual's disability with the physical and social environments in which that person is functioning or expected to function. Handicaps include physiological impairments such as deafness, blindness, and orthopedic impairment; chronic health impairments such as heart conditions, leukemia, and epilepsy; emotional disturbance; mental retardation; learning disability; and speech impairment. Compare *disability* and *impairment*.

Hashish: A resin obtained from the Indian hemp (marijuana) plant, *Cannabis sativa*, ingested for its intoxicating qualities. Hashish has a higher concentration of *THC* (tetrahydrocannabinol) than marijuana.

Head of household: See *householder*.

Health: Most broadly, a state of optimal physical, mental, and social well-being, and not merely the absence of disease and infirmity. See *adolescent health*.

Health outcome: A measure of the effectiveness of preventive or treatment health services, typically in terms of patient health status, but sometimes in terms of patient satisfaction. Attributing changes in outcomes to health services requires distinguishing the effects of the many other factors that influence patients' health and satisfaction.

Health promotion: A philosophy of health or a set of activities that takes as its aim the promotion of health, not just the prevention of disease. See also *mental health promotion*.

Health protection: Strategies for health promotion and disease prevention that are related to environmental or regulatory measures that confer protection on large population groups.

Heavy use of alcohol: Defined in the *NIDA Household Survey on Drug Abuse*, as drinking five or more drinks on the same occasion (i.e., within a few hours) on 5 or more days in the past 30 days.

Heroin: A strongly physiologically addictive narcotic made from, but more potent than, morphine. Heroin is classified by the Federal Government as a controlled substance in Schedule I, the riskiest of five categories. That means it has high potential for abuse and no legally accepted medical use.

Herpes genitalis (genital herpes): A *sexually transmitted disease (STD)* caused by herpes simplex virus (HSV), usually HSV-2. Symptoms include blister-like sores in the genital region, but diagnosis is by an HSV viral cell culture or antigen detection technique. Potential complications include aseptic meningitis, recurrent infections, and possible maternal to infant transmission. There is no known cure. Compare *herpes labialis* and *ocular herpes* (nongenital herpes).

Herpes labialis: A nongenital *herpes simplex virus (HSV) infection*, usually caused by HSV-1. Herpes labialis is primarily spread by oral secretions, usually occurring as a concomitant of fever, but sometimes also developing in the absence of fever or prior illness. Symptoms include blister-like sores in the vermillion border of the lips. Also called cold sore and fever blister. Compare *herpes genitalis, ocular herpes*.

Herpes simplex virus (HSV) infection: A group of acute infections caused by herpes simplex virus (HSV) type 1 (HSV-1) or type 2 (HSV-2), characterized by the development of one or more small fluid-filled vesicles with a raised erythematous base on the skin or mucous membrane, and occurring as a primary infection or recurring because of reaction of a latent infection. Type 1 infections usually involve nongenital regions of the body (see *herpes labialis, ocular herpes*), whereas in type 2 infections, the lesions are primarily seen on the genital and surrounding areas (see *herpes genitalis*).

High school: A secondary school offering the final years of high school work necessary for graduation, usually including grades 10, 11, and 12 (in a 6-3-3 plan) or grades 9, 10, 11, and 12 (in a 6-2-4 plan).

High School and Beyond Survey: A national longitudinal survey of 1980 high school sophomores and seniors conducted by the National Center for Education Statistics in the U.S. Department of Education. The base year survey was a probability sample of 1,015 high schools with a target number of 35 sophomores and 36 seniors in each of the schools. A total of 58,270 students participated in the base-year survey. Students competed questionnaires and took a battery of cognitive tests. Followup activities took place in 1982, in 1984 (with about 12,000 members of the senior cohort and about 15,000 members of the sophomore cohort), and in the spring or 1986 (with samples about the same size as those used in 1984). Several small groups in the population were oversampled to allow for special study of certain types of schools and students.

Hispanic: A person who identifies himself or herself as of Hispanic origin, or, less typically, individuals with Hispanic surnames identified by others (e.g., health care providers identifying patients in surveys) as being of Hispanic origin. Hispanics can be individuals whose families or ancestors have emigrated directly from Mexico, Puerto Rico, Cuba, Central or South America, Spain, or other Spanish culture or origin, regardless of race. Compare *black, white, Asian or Pacific Islander*, and *American Indian or Alaska Native*.

Hispanic Health and Nutrition Examination Survey (HHANES): A one-time survey, similar to the *National Health and Nutrition Examination Survey (NHANES)*, conducted from 1982 to 1984 that collected data on a 12,000-person sample of the three major subgroups of the Hispanic population—Mexican-Americans in the Southwest; Cubans in Miami, Florida, and Puerto Ricans in New York City.

Home-based mental health services: *Mental health services* and referral to related services (e.g., *social services*) delivered in the home, usually to the entire family, as well as the identified client, usually in response to a crisis.

Homelessness: The state of being without one's own home, either on one's own, with one's family, living on the street or in a shelter or other temporary situation (e.g., with relatives or friends). See *runaway, street kid*, and *thrownaway*.

Hormones: Chemical substances, formed in one organ or part of the body and carried in the blood to another organ or part, that can alter the functional activity (and sometimes the structure) of another organ or organs.

Hot line: A telephone service that provides information and referral and immediate counseling, frequently in a crisis situation. An example is the National Runaway Switchboard funded under the Federal Runaway and Homeless Youth Act, which has served as the Adolescent Suicide hot line.

Household: As defined by the U.S. Department of Commerce, Bureau of the Census, definition, all the persons who occupy a housing unit (i.e., a house, an apartment or other group of rooms, or a single room occupied or intended for occupancy as separate living quarters, that is, when the occupants do not live and eat with any other persons in the structure and there is direct access from the outside or through a common hall).

Householder: In U.S. Department of Commerce, Bureau of the Census, counts the first adult *household* member listed on any census questionnaire. Census instructions call for listing first the person (or one of the persons) in whose name the home is owned or rented. If a home is owned jointly by a married couple, either the husband or the wife may be listed first, thereby becoming the reference person, or householder, to whom the relationship of other household members is to be recorded. The term householder is used in the presentation of data that had previously been presented with the designation "head of household." See *family, family household, subfamily*, and *unrelated persons*.

Human immunodeficiency virus (HIV): The virus that causes *AIDS*. Two distinct subtypes of HIV have been identified: HIV-1 was first isolated in 1983 and has a worldwide distribution. HIV-2 was first isolated in 1986 and is found mainly in West Africa.

Hyperthermia: Fever, especially therapeutic fever.

Hypnotics: Drugs that act to induce sleep.

Hypothermia: A body temperature below the normal value.

Iatrogenic effects: Adverse conditions that are induced inadvertently by a health care provider or by the treatment.

ICD-9-CM: See *International Classification of Diseases, ninth revision, Clinical Modification*.

Illicit drugs: In this Report, unless otherwise noted, a term used to refer to *drugs* which are not legally available to adults (e.g., marijuana, cocaine, hallucinogens, PCP, heroin) or the illicit use of prescription drugs to get high or for other mental effects. The *NIDA Household Survey on Drug Abuse* defines illicit drugs as "marijuana, cocaine, inhalants, hallucinogens, PCP, heroin, or nonmedical use of psychotherapeutics." The *Monitoring the Future/High School Seniors Survey* defines illicit drugs as "marijuana, cocaine, heroin, or any use which is not under a doctor's orders of other opiates, stimulants, sedatives, or tranquilizers."

Illness: Generally, any departure from good health. The term illness is sometimes used in this Report to refer to a disease rather than an injury.

Impairment: A physiological, anatomical, or mental loss or "abnormality" caused by accident, disease, or congenital condition. An impairment may be the underlying cause of a disability. Compare *disability* and *handicap*.

Incidence: In health epidemiology, the measure of the number of new cases of a particular disease or condition occurring in a population during a given period of time. **Incidence rate** is the number of new cases of specified disease divided by the number of people in a population over a specified period of time, usually 1 year. Compare *prevalence*. In the criminal justice field, the term incidence is used somewhat differently. See *incidence rate for an offense*.

Incidence rate for an offense: In the criminal justice field, the number of offenses of a given type that occur in a given population during a specified time period per some population base. *Arrest rates, offending rates*, and *victimization* rates are analogous to incidence rates. Compare *prevalence rate for an offense*.

Independent living programs: Programs to help adolescents leaving foster care learn skills for living on their own (e.g., managing finances, problem-solving, and employment training). The programs are authorized by Title IV-E of the Social Security Act. Compare *transitional living programs*.

Indians: American Indians in the continental United States, and American Indians, Aleuts and Eskimos in Alaska.

Inhalants: Breathable chemicals that produce psychoactive (mind-altering) vapors. They include solvents (e.g., model airplane glue, nail polish remover, lighter and cleaning fluids, gasoline), aerosols (e.g., paints, hairsprays), some anesthetics (e.g., nitrous oxide), and other chemicals (e.g., amyl nitrite and butyl nitrite).

Injury: Harm or hurt inflicted to the body by an external force.

Inpatient care: Care that includes an overnight stay in a medical facility.

Inpatient psychiatric facilities: Psychiatric inpatient units in State and county mental hospitals, general hospital psychiatric units, and private psychiatric hospitals. See also *mental/psychiatric hospital*.

Inpatient substance abuse treatment: Treatment for *psychoactive substance abuse* problems that involves an overnight stay in a hospital facility specializing in addiction, a psychiatric hospital, or a general hospital. Hospitals generally offer medically managed services, such as medical *detoxification*, as part of treatment. In addition, they usually offer therapy groups, individual therapy, and onsite educational facilities. Compare *residential substance abuse treatment, outpatient substance abuse treatment*.

Institutional environments: See *juvenile justice facilities.*

Intensive probation programs (for adolescent juvenile offenders): Programs that provide intensive supervision of juvenile offenders as an alternative to placement in institutional *juvenile justice facilities.*

International Classification of Diseases, ninth revision, Clinical Modification (ICD-9-CM) Coding: A two-part system of coding patient medical information used in abstracting systems and for classifying patients into diagnosis-related groups (DRGs) for Medicare. The first part is a comprehensive list of diseases with corresponding codes compatible with the World Health Organization's list of disease codes. The second part contains procedure codes, independent of the disease codes.

Intravenous drug use: The intake of drugs (e.g., heroin, cocaine, amphetamines) directly into the veins, usually by means of a needle injection.

Job Corps Program: A program administered by the Employment and Training Administration in the U.S. Department of Labor, providing employment and training in primarily residential centers for socioeconomically disadvantaged young people ages 16 to 21.

Job Opportunities and Basic Skills (JOBS) Program: A program, authorized under the *Family Support Act of 1988 (Public Law 100-485)*, that is designed to provide families receiving *Aid to Families With Dependent Children (AFDC)* the opportunity to take part in education, job training, and work experience programs that will help them avoid long-term dependence on public assistance programs. Young single parents with children over age 3 and with child care and out-of-school youth ages 16 and over are expected to participate.

Junior high school: A separately organized and administered secondary school intermediate between the elementary and senior high schools, usually including grades 7,8, and 9 (in a 6-3-3 plan) or grades 7 and 8 (in a 6-2-4 plan).

Juvenile: A young person who has not yet reached the age at which he or she should be treated as an adult for purposes of criminal law. In some States, this age is 17. In law, the terms juvenile and minor are usually used in different contexts (juvenile when referring to young legal offenders and minor when referring to legal majority or capacity).

Juvenile court system: Juvenile courts and juvenile detention and correctional facilities. See *juvenile justice system.*

Juvenile detention and correctional facilities: See *juvenile justice facilities.*

Juvenile justice facilities: Custodial facilities for juveniles. These can be classified along several, often overlapping, dimensions that include purpose, term of stay, type of environment (institutional or open), and sponsorship (public or private). **Juvenile detention facilities and shelters** typically hold adolescents while they are awaiting adjudication or after adjudication while they are awaiting disposition and long-term placement. **Juvenile correctional facilities** hold adolescents after adjudication for the purpose of commitment or for supervision and treatment. **Short-term juvenile facilities**, which include juvenile detention facilities and shelters, are typically used for adolescents who are awaiting adjudication, adolescents who have been sentenced to short periods of confinement, or adolescents who are awaiting transfer to long-term placements. **Long-term facilities**, which range from training schools to less restrictive facilities such as ranches, forestry camps, or farms to even less restrictive halfway houses and group homes, primarily serve adolescents who have been adjudicated. Juvenile facilities with **institutional environments** impose greater restraints on residents' movements than facilities with **open environments**. **Public juvenile facilities** are under the direct administration and operational control of a State or local government and staffed by governmental employees. **Private juvenile facilities** are either profitmaking or nonprofit and subject to governmental licensing but are under the direct administration and operational control of private enterprise; such facilities may receive substantial public funding in addition to their support from private sources.

Juvenile justice system: The system that includes law enforcement officers and others who refer delinquent and maltreated minors to the courts, *juvenile courts* which apply sanctions for delinquent offenses and oversee the implementation of child protective services, *juvenile detention and correctional facilities*, and agencies that provide *protective services* and care (e.g., foster care) for minors who are victims of abuse and neglect. The latter agencies intersect with the child welfare or *social services* system.

Juvenile offender: A juvenile who has violated the law.

Juvenile private facilities: See *juvenile justice facilities.*

Juvenile public facilities: See *juvenile justice facilities.*

Larceny-theft (except motor vehicle theft): See *serious property offenses.*

Late adolescence: Occurs for those individuals, typically ages 18 to the mid-20s, who because of educational goals and other social factors, delay their entry into adult roles. Compare *early adolescence, middle adolescence, younger adolescents,* and *older adolescents.*

Latino: Of Latin American origin.

Learning disabilities: According to the National Conference on Learning Disabilities, "learning disabilities" is a generic term that refers to "a heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning, or mathematical abilities, or of social skills." These disorders are intrinsic to the individual and presumed to be due to central nervous system dysfunction.

Least restrictive environment: The setting for the treatment of mental health problems that allows for the greatest possible interaction between the patient and his or her normal surroundings (e.g., family, school, friends, community), within therapeutic constraints. It is a generally accepted principal of mental health professionals that care should be provided in the least restrictive environment possible.

Legal access (to health services): In this Report, used to refer to aspects of access that have to do with consent and confidentiality. Compare *financial access*.

Leukemia: A malignant proliferation of blood leukocytes (white blood cells), ultimately resulting in death. Leukemias (followed by brain and nervous system cancers) are the most common cause of cancer deaths among U.S. adolescents. The most common form of leukemia experienced by adolescents is acute lymphoblastic leukemia.

Life expectancy: Expected duration of life.

Life skills training: The formal teaching of the requisite skills for surviving, living with others, and succeeding in a complex society. Life skills training interventions emphasize the teaching of *social competence*, cognitive skills, and *decisionmaking skills*.

Limitation of activity: See *activity limitation*.

Lipoprotein: Any complex or compound of lipids (fats) with proteins, important for lipid transport and as components of membranes. See *cholesterol*.

Locus of control (perceived): An individual's general sense that he/she either controls or is controlled by events.

Longitudinal studies: Studies that examine the development of individuals or families or groups over a period of time.

Long-term juvenile facilities: See *juvenile justice facilities*.

LSD (lysergic acid diethylamide): A *hallucinogen* made from lysergic acid, which is found naturally in ergot, a fungus that grows on grains. It is usually taken orally in the form of tablets, squares of absorbent paper or gelatin, or liquid. LSD's potency can be extraordinarily high (about 1,000 times that of mescaline). LSD is classified by the Federal Government as a controlled substance in Schedule I, the riskiest of five categories. That means it has a high potential for abuse and no legally accepted medical use.

Major activity of daily living: As defined by the *National Health Interview Survey* conducted by DHHS, major activity for children 5 to 17 usually refers to school attendance; for individuals age 18 and over, it usually refers to a job, housework, or school attendance. See also *activity limitation*.

Malignant neoplasm: An expanding lesion composed of proliferating cells; a tumor.

Malocclusion: Any deviation from normal alignment of the upper and lower teeth.

Maltreatment: *Physical, emotional, or educational neglect*, or *physical, emotional or sexual abuse*, most often perpetrated by a family member.

Marijuana: The dried leaves, stems, and flowers of the hemp plant, *Cannabis sativa*, smoked or used in foods. It produces distorted perception and sometimes hallucinogenic effects. In the *NIDA Household Survey on Drug Abuse*, marijuana includes marijuana and *hashish*.

Maternal and Child Health (MCH) Services Block Grant Program: A Federal *block grant* program authorized under Title V of the Social Security Act, that supports the provision of health services to mothers and children, especially those with low income or living in areas with limited availability of health services. Funds are provided to States, which in turn may provide them to local health departments. Created by the Omnibus Budget Reconciliation Act of 1981, the MCH block grant consolidated several categorical grant programs into one block grant. The MCH Block Grant Program is administered at the Federal level by the Bureau of Maternal and Child Health in the Health Resources and Services Administration in DHHS.

Maternity care: Labor and delivery care.

Medicaid: A federally aided, State-administered program, authorized under Title XIX of the Social Security Act, that provides medical assistance for low-income people meeting specific income and family structure requirements. Medicaid covers an estimated 4.5 million individuals ages 10 to 18 and is the major health care financing mechanism for the adolescents in low-income families.

Menarche: The beginning of menstruation.

Menses: The monthly flow of blood from a woman's genital tract; menstruation.

Mental disorders: See *diagnosable mental disorders*.

Mental health organization: See *specialty mental health organization*.

Mental health problems: Problems that include *diagnosable mental disorders* and *subjective distress*.

Mental health promotion: Efforts based on the general philosophy that it is desirable to maintain well-adjusted individuals able to function in psychologically healthy ways. The most widely used mental health promotion programs are designed to enhance individuals' life skills and social competence by strengthening their adaptive abilities and creating mental-health-promoting environments. Some mental health programs for adolescents are designed to strengthen their autonomy and ability to cope with stressors, while promoting their self-esteem and appropriate peer relationships.

Mental health services: Care for the treatment of *mental health problems. Third-party payment* for mental health services is usually limited to services for *diagnosable mental disorders* and is not available for services to relieve *subjective distress* without an accompanying diagnosable mental disorder. According to the *Child and Adolescent Service System Program (CASSP)*, mental health services for children and adolescents should include prevention, early identification and intervention, assessment, *outpatient mental health care, home-based mental health services, partial hospitalization/day treatment*, emergency services, *therapeutic foster care*, therapeutic group care, therapeutic camp services, *independent living services*, residential treatment services, crisis residential services, and *psychiatric hospitalization.*

Mental health system: See *mental health services.*

Mental illness: For purposes of this Report, disorders relating to the mind independent of the body. The distinction is somewhat arbitrary, however, because some mental disorders have a physiological basis.

Mental/psychiatric hospital: See *psychiatric hospital.*

Mentoring: The practice of acting over time as a guide, tutor or coach, and sometimes as an advocate for another, typically not biologically related, person.

Meta-analysis: A statistical or quantitative analysis of a large collection of results from individual studies for the purpose of integrating the findings.

Metabolism: The totality of the chemical processes occurring in a living organism, especially those associated with the exchange of matter and energy between a cell and its environment.

Metropolitan Statistical Area (MSA): As defined by the U.S. Office of Management and Budget, a county or group of counties that includes either a city of at least 50,000 residents, or an urbanized area with at least 50,000 people that is itself part of a county/counties with at least 100,000 total residents. Compare *non-Metropolitan Statistical Areas.*

Middle adolescence: Typically, a time of increasing independence. Generally takes place during the period from ages 15 through 17. For those adolescents who do not go on to (and remain in) college, age 17 or completion of high school marks the end of adolescence, in social terms. Compare *early adolescence, late adolescence, younger adolescents*, and *older adolescents.*

Minimum competency testing (MCT): Measuring the acquisition of competence or skills to or beyond a certain specified standard.

Minor: A person who is under the age of legal majority, either age 18 or 19, depending on the State. Compare *juvenile.*

Minor offenses: See *Part II offenses.*

Minorities: See *racial and ethnic minorities.*

Monitoring the Future/High School Seniors Survey: A survey of high school seniors, with followup data collected when the individuals are young adults (e.g., in college), conducted by researchers at the Institute for Social Research at the University of Michigan with support from the National Institute on Drug Abuse within DHHS.

Mood disorders: Typically, *depressive* or *anxiety disorders.* Diagnoses of **depressive disorder** are made when individuals suffer from prolonged and severely disabling depression, as distinguished from the temporary and normal moods of unhappiness. Feelings of worthlessness, hopelessness, or irritability and thoughts of death or suicide are common. There is some evidence that antisocial behavior, aggressiveness, or substance abuse may hide or mask clinical depression but this notion remains controversial. Diagnoses of **anxiety disorders** are made when individuals are excessively apprehensive, tense, or uneasy in anticipation of internal or external danger. This anxiety is manifested by physiological changes such as sweating, tremor, and rapid pulse.

Mortality rate: A measure derived by dividing the number of deaths in a population in a given period by the resident population at the middle of that period. It is expressed as the number of deaths per 1,000 population. The rate may be restricted to deaths in specific age, race, sex, or geographic groups (e.g., 15 deaths per 1,000 persons ages 15 to 19), or it may be related to the entire population.

Motor vehicle theft: See *serious property offenses.*

Multiservice mental health organization: An administratively distinct organization that provides any combination of two or more services (inpatient, residential treatment, residential supportive, outpatient or partial care) in settings that are under the organization's direct administrative control.

Murder and nonnegligent manslaughter: See *serious violent offenses.*

Muscular dystrophy: Any of a group of genetically determined, primary degenerative myopathies of unknown etiology, characterized by various patterns of selective atrophy and weakness of the voluntary muscles, leading as a rule to progressive disability.

Myelodysplasia: Any developmental defect of the spinal cord.

Narcotics: Drugs that produce narcosis (a nonspecific and reversible depression of function of the central nervous system marked by stupor or insensibility produced by drugs). The term is applied especially to natural or synthetic drugs that have morphine-like actions.

National Adolescent Student Health Survey (NASHS): A survey conducted in 1987 by a consortium of groups funded partially by the Federal Government that questioned more than 11,000 8th and 10th graders nationwide about their health.

National Ambulatory Medical Care Survey (NAMCS): A continuing national probability sample of ambulatory medical encounters, sponsored by the National Center for Health Statistics in DHHS. It collects data on physician-patient encounters in the offices of a sample of non-federally employed physicians classified as "office-based, patient care physicians." Sample physicians are asked to complete a patient record information form for a systematic random sampling of office visits occurring during a randomly assigned 1-week period.

National Assessment of Educational Progress: A cross-sectional study designed and initially implemented in 1969 that has gathered information about selected levels of achievement across the country. The National Assessment of Educational Progress has surveyed the educational attainments of 9-, 13-, and 17-year-olds and young adults (ages 25 to 35) in 10 learning areas to measure possible changes in educational achievement.

National Drug and Alcoholism Treatment Unit Survey (NDATUS): A national survey that is designed to measure the location, scope, and characteristics of drug abuse and alcoholism treatment and prevention facilities, services, and activities throughout the United States. The survey provides a cross-sectional look at treatment patients on a given day annually (e.g., Oct. 30, 1987). It covers both private and publicly funded programs. The 1987 NDATUS was a joint effort of the National Institute on Drug Abuse and the National Institute on Alcohol Abuse and Alcoholism in DHHS, with cooperation from the Veterans Administration and the Federal Prison System.

National Evaluation of School Nutrition Programs: A survey, conducted occasionally by the U.S. Department of Agriculture, that collects information on U.S. adolescents use of school nutrition programs such as the *National School Lunch Program.*

National Health Examination Survey (NHES): A continuing nationwide sample survey in which data for determining health status were collected through direct standardized physical examinations, clinical and laboratory tests, and measurements. The survey was conducted by the U.S. Department of Health, Education, and Welfare in 1963-65 and 1966-70.

National Health Interview Survey (NHIS): A nationwide household interview survey in which personal interviews with approximately 40,000 households are used to obtain information health, illness, and disability status of the *civilian noninstitutionalized population.* Each year, the survey consists of a basic set of questions on health, socioeconomic, and demographic items, as well as one or more special questionnaires to obtain more detailed information on issues of current concern (e.g., on child adoption and cancer risk factors in 1986, child health in 1988). For individuals under age 17, information is collected from a proxy respondent, typically a parent or guardian. NHIS is conducted by the National Center for Health Statistics in DHHS.

National Health and Nutrition Examination Survey (NHANES): A survey in which data for assessing the health status of the U.S. population are collected through direct standardized physical examinations, clinical and laboratory testing, and related procedures. These examinations are the most authoritative source for standardized clinical, physical, and physiological data on the U.S. population. NHANES I was conducted from 1971 through 1974, and a major purpose was to measure indicators of the nutritional status of the civilian noninstitutionalized U.S. population ages 1 through 74. NHANES II was conducted from 1976 through 1980 and oversampled children ages 6 months to 5 years, persons ages 60 to 74, and persons living in poverty. NHANES III, being conducted from 1988 through 1994, will include 45,000 persons representative of the U.S. population and has been designed to provide reliable estimates on a number of subgroups of the population, including adolescents, NHANES is conducted by the National Center for Health Statistics in DHHS. See also *Hispanic Health and Nutrition Examination Survey.*

National Hospital Discharge Survey (NHDS): A nationwide survey of a sample of short-stay hospitals in the United States. The basic unit of estimation for NHDS is the sample patient abstract. NHDS is conducted by the National Center for Health Statistics in DHHS.

National Household Surveys on Drug Abuse: See *NIDA Household Survey on Drug Abuse.*

National Longitudinal Survey of Labor Market Experience—Youth Cohort (NLSY): A longitudinal survey sponsored by the U.S. Department of Labor that began in 1979 and has been surveying a representative sample of over 12,000 Americans who were ages 14 to 21 as of January 1, 1979 (with an oversampling of blacks, Hispanics, and economically disadvantaged whites).

National Medical Care Utilization and Expenditure Survey (NMCUES): A series of several related surveys on health, access to and use of medical (and dental) services, associated charges and sources of payment, and health insurance coverage during 1980. The household portion of NMCUES consisted of: 1) a national household survey of a sample of the civilian noninstitutionalized population, and 2) a household survey of the Medicaid-eligible populations of the States of New York, California, Texas, and Michigan. These two surveys each consisted of five interviews over a period of about 15 months to obtain information on medical care utilization, expenditures, and other health-related information. A third survey, an administrative records survey, was designed to verify the eligibility status of the household survey respondents for the Medicare and Medicaid programs. The survey was conducted by the National Center for Health Statistics within DHHS.

National Nutrition Monitoring System: A system operated by the U.S. Department of Agriculture and DHHS that systematically monitors food consumption, dietary status, and the nutritional health of the U.S. population. It includes the *Continuing Survey of Food Intakes by Individuals (CSFII)* and the *Nationwide Food Consumption Survey (NFCS).*

National PRIDE Survey: A survey of adolescents' use of psychoactive substances conducted in the 1988-89 school year, based on a questionnaire devised by the parents' group National Parents' Resource Institute for Drug Education (PRIDE). The questionnaire was not distributed to a random sample of schools, and participating schools had the option of not reporting results back to the National PRIDE office.

National School Lunch and Breakfast Programs: Programs administered at the Federal level by the U.S. Department of Agriculture that provide meals for low-income school children free or at a reduced price, depending on family income. Forty-three percent of individuals in the National School Lunch Program and 24 percent in the National School Breakfast Program are adolescents ages 13 to 18.

National Survey of Family Growth (NSFG): A household interview survey that has collected data from U.S. women of childbearing age (ages 15 through 44) in four cycles since 1974. NSFG collects data on the demographic and social factors associated with childbearing, adoption, and maternal and child health—including sexual activity, contraception and sterilization, marriage, pregnancy loss, and use of medical care for family planning and prenatal care. Cycles I and II, conducted in 1973 and 1976, interviewed about 10,000 ever-married women ages 15 to 44. Cycle III and IV, conducted in 1982-83 and 1988, included all women regardless of marital status. Cycle III oversampled females ages 15 to 19 to provide more reliable data on these groups. The samples for both included roughly 8,000 women ages 15 through 44 in the *civilian noninstitutionalized population.* NSFG is conducted by the National Center for Health Statistics in DHHS.

National vital statistics system: A system maintained by the National Center for Health Statistics in DHHS to collect and publish data on births, deaths, marriages, and divorces in the United States. Information on births and deaths is collected from the registration offices of all States and the District of Columbia, Puerto Rico, the U.S. Virgin Islands, and Guam.

Nationwide Food Consumption Survey (NFCS): A survey, conducted by the Human Nutrition Service of the U.S. Department of Agriculture every 10 years, that is designed to collect information on foods used by households and eaten by individuals. The most recent survey was conducted in 1987-88.

Natural causes of death: Deaths caused by illness, disease, or chronic conditions as opposed to death caused by external causes such as accidental injuries, homicide, and suicide.

Neglect: See *physical neglect, emotional neglect, educational neglect.*

Nicotine: A *psychoactive substance* that is contained in tobacco. Nicotine is a behavioral *stimulant.*

NIDA Household Survey on Drug Abuse: A household survey, sponsored since 1974 by the National Institute on Drug Abuse within DHHS, that collect data on the in use of *marijuana* and other *illicit drugs, tobacco,* and *alcohol* among the U.S. population 12 years of age and over living in households in the coterminous United States. Youths (12 to 17 years of age) and young adults (ages 18 to 25 years of age) are oversampled, as are blacks and Hispanics.

Nongenital herpes: See *herpes labialis, ocular herpes.*

Nonmedical use of any psychotherapeutic: In the *NIDA Household Survey on Drug Abuse*, this refers to the nonmedical use of four classes of prescription drugs: 1) sedatives (e.g., downers, barbiturates, and Seconal^{R}); 1) tranquilizers (e.g., antianxiety drugs like Librium^{R}, Valium^{R}, Ativan^{R}, and Meprobamate^{R}); 3) stimulants (e.g., uppers, amphetamines, speed, and Preludin®); and 4) analgesics (e.g., Darvon^{R}, Demerol^{R}, Percodan^{R}, and Tylenol^{R} with codeine). NIDA defines psychotherapeutics as prescription medications which also can be used illicitly to get high or for other mental effects. Compare *nonmedical use of drugs.* See *psychotherapeutic drugs.*

Nonmedical use of drugs: In the Drug Abuse Warning Network (DAWN) of the National Institute on Drug Abuse (NIDA), nonmedical use of drugs is defined as: 1) the use of prescription drugs in a manner inconsistent with accepted medical practice; 2) the use of over-the-counter drugs contrary to approved labeling; or 3) the use of any substance (heroin, marijuana, peyote, blue, aerosols, etc.) for psychic effect, dependence, or suicide). Compare *nonmedical use of any psychotherapeutic.*

Non-Metropolitan Statistical Areas: Those areas of the United States that are not part of a *Metropolitan Statistical Area (MSA)*, according to the U.S. Bureau of the Census. Such areas include small communities, *rural* nonfarm areas, and rural farm areas.

Obesity: Can be defined in different ways: 1) body mass index (BMI)—weight in kilograms divided by height in meters squared [m^2])—greater than or equal to the 95th percentile of a similar population group (usually by age); or 2) 20 percent or more over "normal" weight. Being obese is a more serious problem than being *overweight*.

Ocular herpes: A nongenital *herpes simplex virus (HSV) infection*, evidenced by blisters in and around the eyes. Compare *herpes genitalis, herpes labialis*.

Offending rate: The number of offenses that occur in a given population during a specified time period per some population base (e.g., 5 offenses per 100,000 population). The offending rate is usually based on offenses that are self-reported by offenders. Like the arrest rate, the offending rate is analogous to an incidence rate.

Offenses (serious and minor): Infractions of the law irrespective of the age of the offender. For purposes of this Report, **serious offenses** are Federal Bureau of Investigation Part I offenses (see below) even though individual Part I offenses may not be considered serious by other definitions. **Minor offenses** are Federal Bureau of Investigation Part II offenses (see below) even though individual Part II offenses may not be considered minor by other definitions. See also *minor offenses, Part I offenses, Part II offenses, serious property offenses, serious violent offenses*.

Office visit: As defined by DHHS's National Center for Health Statistics for the purpose of the *National Ambulatory Medical Care Survey*, any direct personal exchange between an ambulatory patient and a physician or members of his or her staff for the purposes of seeking care and rendering health services.

Older adolescents: As defined in most of DHHS's National Center for Health Statistics data analyses, adolescents ages 15 to 19. Compare *younger adolescents*.

Opiates: Any *psychoactive substances* containing or derived from *opium* (e.g., heroin, morphine); also, any drugs that induce sleep.

Opioids: Any synthetic narcotics that have opiate-like activities but are not derived from *opium*.

Opium: A crude resinous exudate from the opium poppy, *Papaver somniferum*.

Oppositional defiant disorder: A mental disorder defined in *DSM-III-R* as a behavior disorder that is diagnosed on the basis of a pattern of hostile and defiant behavior. Adolescents with oppositional defiant disorder are often argumentative, resentful, and easily annoyed by others, but not physically aggressive or prone to violate social norms.

Oral contraceptives: Birth control pills. One advantage of these for adolescents is that they exert a protective effect against *pelvic inflammatory disease (PID)*.

Orthodontics: The area of dentistry concerned with the bite and how teeth mesh together.

Orthodontic Treatment Priority Index (TPI): An index of the need for orthodontic treatment based on a score ranging from 0 (normal occlusion, or bite) to 10 (very severe malocclusion, with treatment mandatory). A score of 4 to 6 is considered a definite malocclusion, but treatment is elective.

Osteoporosis: Reduction in bone density, often the result of reduction in estrogen secretion in the ovaries during amenorrhea or menopause. Symptoms include vertebral fractures and "dowager's hump."

Outcome evaluation: Measures an intervention's result (e.g., increased knowledge, changed behavior). Compare *process evaluation*.

Outpatient care: Generally, medical care that is provided in a hospital and does not include an overnight stay. Sometimes (as in *mental health services*) used to refer to *ambulatory care*.

Outpatient mental health care: Mental health services provided to ambulatory patients or clients who do not need either 24-hour supervision or partial hospitalization. As a general matter, outpatient services include psychotherapy and psychotropic prescriptions in outpatient clinics and private practice, crisis services such as home-based treatment, and services in emergency rooms.

Outpatient mental health services provided in organized mental health settings: See *outpatient mental health care* and *specialty mental health organizations*.

Outpatient substance abuse treatment: Treatment for substance abuse problems provided to patients or clients who are not deemed to need 24-hour supervision, or for whom such care is not available. The most intensive outpatient treatment programs are day treatment programs, in which the participant arrives early in the day and returns home in the evening. Outpatient drug-free programs are oriented around counseling rather than medical intervention. If a person needs medically managed *detoxification*, that is handled in a different setting.

Over-the-counter (OTC) drugs: Drugs that can be legally purchased at a drug store without a prescription.

Overweight: Can be defined as body mass index (BMI) (weight in kilograms divided by height in meters squared [m^2]) greater than or equal to the 85th percentile of a similar group. Compare *obesity*.

Own children: As defined by the U.S. Department of Commerce, Bureau of the Census, "own" children in a *family* are sons and daughters, including stepchildren and adopted children, of the *householder*.

Paraphimosis: Retraction of foreskin affected by *phimosis*, causing a painful swelling of the glans that, if severe, may cause dry gangrene unless corrected.

Parental consent requirement (applicable to health care of minors): As used in this Report, a legal requirement, grounded in common law, that a parent or other guardian of a minor child must give prior consent to the delivery of medical or surgical care to that child. Over the years, the number of exceptions to the parental consent requirement applicable to the health care of minors has grown significantly.

Part I offenses (index offenses): Under the Federal Bureau of Investigation's reporting system, these are violent offenses against a person (i.e., murder and nonnegligent manslaughter, forcible rape, robbery, and aggravated assault) and specified property offenses (i.e., burglary, larceny-theft, motor vehicle theft, and arson). For purposes of this Report, Part I offenses are considered serious offenses. See also *serious violent offenses* and *serious property offenses.*

Part II offenses: Under the Federal Bureau of Investigation's reporting system, these are any offenses not classified as Part I offenses. Part II offenses include two categories of offenses: 1) acts other than Part I offenses that are considered crimes if committed by adults (e.g., involvement with stolen property, driving under the influence, assault without weapons, engaging in prostitution); and 2) status offenses (acts such as running away from home that are considered offenses only because they are committed by minors). For purposes of this Report, Part II offenses are considered serious offenses.

Partial hospitalization/day treatment: A planned program of mental health treatment services generally provided in sessions of 3 to 6 hours to groups of patients or clients who do not require 24-hour supervision. This level of care offers more intensive treatment than the usual outpatient care (once a week psychotherapy) and provides a range of treatment modalities (individual and group therapy, education, and rehabilitation). Partial care/day treatment can be offered in *general hospitals with separate psychiatric services, psychiatric hospitals, freestanding psychiatric outpatient clinics,* or *multiservice mental health organizations.*

PCP (phencyclidine): A drug developed in the 1950s as an anesthetic that was taken off the market in 1967 when it was realized that it caused hallucinations in some people. PCP is not easily categorized because, in addition to being able to cause hallucinations, PCP can relieve pain or act as a stimulant. It can also produce violent or bizarre behavior. Some surveys (e.g., the *NIDA Household Survey on Drug Abuse* and in the *Monitoring the Future/High School Seniors Survey*) consider PCP a hallucinogen. In the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R),* PCP is considered separately from hallucinogens. PCP is now used legally only in veterinary medicine as an immobilizing agent.

Peer tutoring: Using older or same age students to work individually with students to teach a particular content area.

Pelvic inflammatory disease (PID): A *sexually transmitted disease (STD)* among females, the symptoms of which include abdominal pain, fever, chills, vomiting, foul-smelling discharge, and postcoital bleeding. Potential complications include sterility, chronic pain, chronic infections, and even death. Methods of prevention include limiting the number of sexual partners, using of condoms, and avoiding the use of intrauterine contraceptive devices. Treatment is with antibiotics.

Periodontal disease: Any disease of the tissue surrounding the teeth. The two most prevalent periodontal diseases are **gingivitis** (inflammation confined to the gums) and **periodontitis** (inflammation of both the gum and the other supporting structures of the teeth).

Phenylketonuria: A genetic disorder of amino acid metabolism characterized by the inability to metabolize the amino acid phenylalanine. If diagnosis and dietary treatment is not begun within 30 days of birth, severe mental retardation will result.

Phimosis: Constriction of the orifice so that the prepuce (foreskin) cannot be retracted back over the glans of the penis. Compare *paraphimosis.*

Physical abuse: Physical violence, including kicking, biting, hitting with one's fist, beating, burning, or scalding, and using a weapon.

Physical illness: For purposes of this Report, disorders of the body independent of the mind. The distinction is somewhat arbitrary, however, because some mental disorders have a physiological basis.

Physical neglect: As defined by DHHS's National Center on Child Abuse and Neglect, physical neglect can take seven forms: refusal to provide health care for physical problems, as recommended by a competent health care professional; delay in providing health care for a serious physical problem; desertion of a child without arranging for reasonable care and supervision (abandonment); other blatant refusals of custody, such as permanent or indefinite expulsion of a child from the home; other custody issues, such as chronically and repeatedly leaving a child with others for days or weeks at a time; inadequate supervision; and other physical neglect, such as conspicuous inattention to avoidable hazards in the home.

Place: As defined by the U.S. Department of Commerce, Bureau of the Census, a place is either: 1) an incorporated place such as a city, a borough, a town, or village; or 2) a closely settled population center that is outside an urbanized area, does not have corporate limits, and (unless it is in Alaska or Hawaii) has a population of at least 1,000.

Plaque: A soft deposit of bacteria and other materials on the surface of a tooth.

Preclinical: The period preceding clinical manifestations.

Preconscious: Pertaining to mental events, processes, and contents that are for the most part capable of reaching or being brought into conscious awareness of the act of focusing attention.

Pregnancy Discrimination Act of 1978 (Public Law 95-555): An act that amended the Civil Rights Act of 1964 and requires that employment-based health plans cover pregnancy, childbirth, and related medical conditions as they cover other medical care.

Pregnancy rate: The number of pregnancies per 1,000 population.

Prenatal care: Medical services related to fetal, infant, and maternal health, delivered from time of conception to labor.

Prevalence: In health epidemiology, a measure of the number of individuals in a given population who have a specific disease or other condition at a designated time (or during a particular period).

—**Point prevalence:** the proportion of individuals in a population who have a given condition, which is measured at a particular point in time.

—**Annual prevalence:** the proportion of individuals in a population who have a given condition during a single year.

—**Lifetime prevalence:** a measure of individuals considered at a point in time who have ever had an illness or condition which is under study.

In the criminal justice field, the term prevalence is used somewhat differently. See *prevalence rate for an offense*.

Prevalence rate for an offense: In the criminal justice field, the ratio of the number of persons involved in a given activity at a particular time period to the number of persons in that population. It is often expressed as the percentage of persons in a population who engage in one or more offenses of a given type during a given time period.

Prevention: The averting of a disease or condition, traditionally characterized as primary, secondary, and tertiary prevention. **Primary prevention** is aimed at reducing the incidence of a disease or health problem. **Secondary prevention** strategies detect and/or treat the condition in its early stages of development, with the hope of improving outcome. **Tertiary prevention** attempts to arrest further deterioration in individuals who already suffer from a condition. Alternative terminology includes *universal* (prevention) interventions (analogous to primary prevention and *selected* (prevention) interventions (analogous to secondary prevention).

Preventive health services: Services intended to prevent the occurrence of a problem (e.g., disease or condition). Preventive services typically recommended for adolescents include routine physical examinations, immunizations, and certain diagnostic tests (e.g., hematocrit, urinalysis), and preventive procedures including pap smears and screening for sexually transmitted diseases among the sexually active. Compare *treatment services*.

Primary care: Optimally, primary care includes the following elements: first contact care, comprehensive care, coordinated or integrated care, and care that is longitudinal over time rather than episodic. First contact care is the extent to which a patient contacts the source of care whenever he or she perceived a new need for care. Coordination of care entails a health care provider's ability to provide for continuity of information from visits to other providers (e.g., specialists and emergency facilities) as well as from earlier visits to him or herself. Longitudinality of care is the extent to which a provider serves as a source of care over time regardless of the presence or absence of a particular type of problem.

Primary prevention: See *prevention*.

Private psychiatric hospital: A hospital operated by a sole proprietor, partnership, limited partnership, corporation, or not-for-profit organization, primarily for the inpatient care of persons with mental disorders.

Problem behaviors (in adolescence): Those behaviors that have been deemed socially unacceptable or that lead to poor health outcomes (e.g., *unprotected sexual intercourse, delinquent acts, psychoactive substance abuse*).

Process evaluation: The evaluation of aspects of a program's implementation and operation. Compare *outcome evaluation*.

Prospective study: A study that collects data from the time the research is initiated. Potentially has the advantage of the researcher's being able to assign individuals or groups to experimental and control conditions, and to arrange for collection of a broader range of data. Compare *retrospective study*.

Prostatitis: Inflammation of the prostate, a gland in the male that surrounds the neck of the bladder and the urethra. The prostate contributes to the seminal fluid a secretion that accounts for the liquefaction of coagulated semen.

Protective services: An aspect of *social services* designed to prevent neglect, abuse, and exploitation of children by reaching out with social services to stabilize family life (e.g., by strengthening parental capacity and ability to provide good child care). The provision of protective services follows a complaint or referral, frequently from a source outside the family, although it may be initiated by an adolescent himself/herself.

Psychiatric hospital: A medical facility that offers short-term intensive inpatient treatment and prolonged inpatient treatment to persons suffering from a variety of mental or psychiatric disorders, including alcohol and other drug-related disorders. Such facilities can be public or private. Compare *residential treatment centers*.

Psychiatric hospitalization: Hospitalization in a specialty mental health facility (e.g., *psychiatric hospital*) or in a *general hospital* for purposes of mental health evaluation or treatment.

Psychiatrist: A physician who specializes in the diagnosis, treatment, and prevention of mental disorders.

Psychoactive: Mind-altering.

Psychoactive substance: For the purpose of this Report, the term psychoactive substance, unless otherwise noted, means alcohol, tobacco (nicotine), or an *illicit drug*. The American Psychiatric Association defines the term as any substance that falls into one of the following classes associated with both *psychoactive substance abuse and dependence* (alcohol; sedatives, hypnotics, or anxiolytics; cannabis; cocaine; amphetamine or similarly acting sympathomimetics; hallucinogens; inhalants; opioids/opiates; and phencyclidine (PCP) or similarly acting arylcycloheylamines) or is a form of the substance nicotine, which is associated with dependence but not abuse.

Psychoactive substance abuse: For the purpose of this Report, the term psychoactive substance abuse, unless otherwise noted, means drug use that results in injury, incapacity, dysfunctionality, destruction or damage to self and others. It is important to note, however, that what constitutes psychoactive substance abuse among adolescents—i.e., any use at all or "problem" use—is a matter of controversy. The Office for Substance Abuse Prevention within DHHS is of the view that any use of psychoactive substances by adolescents should be considered abuse. In contrast, the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III-R) distinguishes between psychoactive substance use, abuse, and dependence (without drawing distinctions by age group). According to DSM-III-R, psychoactive substance abuse is a mental disorder defined as a residual category for noting maladaptive patterns of use of a psychoactive substance use that have never met the criteria for psychoactive substance dependence. The maladaptive pattern is indicated by at least one of the following: 1) continued use despite knowledge of having a persistent or recurrent social, occupational, psychological, or physical problem exacerbated by use of the substance; or 2) recurrent use in situations in which use is physically hazardous. The diagnosis is made only if some symptoms of the disturbance have persisted for at least 1 month or have occurred repeatedly over a longer period of time.

Psychoactive substance dependence: As noted above, the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III-R) distinguishes between psychoactive substance use, abuse, and dependence. According to DSM-III-R, psychoactive substance abuse is mental disorder characterized by compulsive behavior and the active pursuit of a lifestyle that centers around searching for, obtaining, and using a psychoactive substance. The diagnosis is made only if at least three of nine diagnostic criteria (e.g., substance often taken in greater amounts or over a longer period than the person intended, great deal of time spent in activities to get the substance; frequent intoxication or withdrawal symptoms when expected to perform major role functions) are met and symptoms of the disturbance have persisted for at least 1 month or have occurred repeatedly over a longer period of time.

Psychotherapeutic drugs: According to the *Monitoring the Future/High School Seniors Survey*, there are four major classes of these drugs: 1) amphetamines, 2) barbiturates, 3) minor tranquilizers, and 4) opiates other than heroin.

Psychotherapy: Broadly defined, all procedures that use psychological methods to influence behavior in a therapeutic direction. The term psychotherapy is usually used to refer to a defined type of treatment that involves interaction by a patient/client and a therapist, either in a dyad or group. Typical therapeutic maneuvers in psychotherapy include suggestion (the induction of a mental state in the patient that is somewhat contrary to reality or the patient's experience or logical expectations), abreaction (the bringing to consciousness and open expression of important feelings and ideas held in repression), manipulation (attempts to neutralize or to mobilize certain preexisting emotional systems [e.g., dependency needs] in the patient), clarification (attempts to bring into focus some of those things that a patient knows only vaguely, either consciously or *preconsciously*), and interpretation (addition of new information to the data already available to the patient, generally in the form of a hypothesis that explains material that is not otherwise understandable to the patient).

Psychotropic: Exerting an effect upon the mind; capable of modifying mental activity; usually applied to drugs that affect the mental state.

Puberty: The period of becoming first capable of reproducing sexually, marked by maturing of the genital organs, development of secondary sex characteristics (e.g., breasts, pubic hair), and in humans and higher primates, the first occurrence of menstruation in the female.

Puerperium: The period after childbirth.

Pulpal: In the context of dentistry, of or relating to dental pulp, the soft sensitive tissue that fills the chamber of a tooth.

Quasi-experimental design: A research design involving an experiment that has a treatment, an outcome measure or measures, and experimental units, but does not use random assignment to create the comparisons from which treatment-caused change is inferred. Instead, the comparisons depend on nonequivalent groups that differ from each other in many ways other than the presence of a treatment whose effects are being tested. The task confronting those who try to interpret the results from quasi-experiments is basically one of separating the effects of a treatment from those due to the initial noncomparability between the average units in each treatment group.

Race: Races can be distinguished by usually inherited physical and physiological characteristics without regard to language or culture (caucasoids, negroid, mongoloid). Beginning in 1976, the Federal Government's data systems classified individuals into the following racial groups: *white* (caucasoid), *black* (negroid), *Asian or Pacific Islander*, or *American Indian and Alaska Native* (mongoloid). See *ethnicity, Hispanic, Indian*. Compare *ethnicity*.

Racial and ethnic minorities: In this Report, individuals who are *not* "white, non-Hispanic." Includes *black, Asian, Hispanic*, and *American Indian and Alaska Native* individuals.

Rampant caries: A rapidly progressing form of dental caries which by definition involves extensive breakdown of enamel and dentin, *pulpal* pathosis, and can occur in patients with or without a significant caries history.

Recidivism: Tendency to relapse into a previous condition or mode of behavior, especially delinquent or criminal behavior.

Recommended dietary allowances (RDAs): The major dietary standard used in the United States. Established by the Food and Nutrition Board of the National Academy of Sciences, RDAs are recommendations for daily dietary intakes of specific nutrients, based on nutritional studies and expert judgment. RDAs differ by gender and age group. For protein, vitamins, and minerals, RDAs meet the needs of 90 to 95 percent of healthy individuals. For energy allowances, the daily allowance meets the average needs of persons of average height and weight in the population.

Remedial education: Instruction for a student lacking the reading, writing, or math skills necessary to perform work at the level required by the attended institution.

Reproductive health care: Can include a wide range of services related to the male or female reproductive systems, including gynecological treatment services (i.e., examination and treatment of the female reproductive organs), and preventive services related to the use of contraception (e.g., counseling, prescribing contraceptive methods, dispensing contraceptives). See also *prenatal care*.

Residential substance abuse treatment: Treatment for *psychoactive substance abuse* in a residential (overnight 24-hour) setting. Residential programs may have locked units, employ nursing and counseling staff very much like those in psychiatric hospitals, and include structured routines They frequently operate on the 28-day model, with a high level of structure in the initial stages and diminished structure as the client earns privileges through program participation and responsibility. There are various models of residential treatment, including the halfway house, the therapeutic community, wilderness challenge programs, and "boot camp" or "shock incarceration."

Residential treatment centers (for emotionally disturbed children): Residential organizations, not licensed as *psychiatric hospitals*, whose primary purpose is the provision of individually planned programs of mental health treatment services in conjunction with residential care for children and youth primarily under the age of 18. Programs must be directed by a psychiatrist, social worker, or psychiatric nurse who has a master's and/or a doctorate degree. At least half of the admissions must be for mental illnesses that can be classified by DSM-II/ICDA-8 or DSM-III/ICD-9-CM codes other than mental retardation or substance abuse codes.

Restitution programs (for adolescent juvenile offenders): Programs for juvenile offenders that require offenders to pay money to their victims to compensate the victims for their loss or require offenders to perform an equivalent amount of public service. Sometimes, restitution programs also involve direct mediation between offenders and their victims.

Restricted-activity day: As defined by the *National Health Interview Survey* conducted by DHHS, any day on which a person cuts down his or her usual activities for more than one-half day because of an illness or an injury. Restricted-activity days are unduplicated counts of *bed-disability days, work-loss days, and school-loss days*, and other days on which a person cuts down on his or her usual activity.

Retrospective study: A study that uses data collected before the research plan has been devised. For example, a study begun in 1991 of hospital discharge abstracts prior to 1991. Has the advantage of the available data not having been influenced beforehand by theories and hypotheses of the researchers, but does not allow for random assignment of research subjects and other beneficial aspects of *experimental design*. Compare *prospective study*.

Risk factors: Factors that put a person at risk for health or other problems.

Risk-taking behavior: An activity that may involve a risk to one's health. For adolescents especially, risk-taking generally carries a negative connotation, but some risk-taking is essential to the further development of competence, and thus some risk-taking can have positive health and other benefits.

Robbery: See *serious violent offenses*.

Runaway: A young person who is away from home at least overnight without the permission of a parent or caretaker. Compare *homelessness, thrownaway*, and *street kid*.

Rural: As strictly defined by the U.S. Department of Commerce, Bureau of the Census, rural refers to *places* of 2,500 or fewer residents.

Safer sex practices: Sexual practices designed to avoid actual and potential transmission of HIV infection and other *sexually transmitted diseases* (e.g., avoiding exchange of body fluids, use of *condoms*).

Salpingitis: Inflammation of the uterine tube.

Schizophrenia: A severe and disabling mental disorder—most likely a group of disorders ("schizophrenic disorders")—characterized in *DSM-III-R* as involving delusions, hallucinations, or certain disturbances in the form of thought; deterioration from a previous level of functioning in such areas as work, social relations, and self-care; duration of at least 6 months; and occurring before age 45, usually in late adolescence or early adulthood.

Schizophrenogenic: Causing schizophrenia.

School climate: The social system and culture of a school, including the organizational structure and the expectations within it.

School-linked health center (SLHC): Any school health center that provides a wide range of medical and counseling services for students (and sometimes for the family members of students and/or school dropouts) and is located either on or near school grounds and is associated with the school. Some SLHCs also provide a wider range of services (e.g., child care, employment training, tutoring, social services, recreational opportunities).

School-loss day: As defined by the *National Health Interview Survey* conducted by DHHS, any day on which a child did not attend school for at least of his or her normal school day because of a specific illness or injury. School-loss days are determined only for children 5 to 17 years of age, beginning in 1982. See also *restricted-activity day.*

Scoliosis: A curvature of the spine in which there is an observable and measurable lateral deviation of part of the spine from the normally straight vertical line.

Secondary prevention: See *prevention.*

Secondary school: A school comprising any span of grades beginning with the next grade following an elementary or middle-school (usually 7,8, or 9) and ending with or below grade 12. Both *junior* and *senior high schools* are included.

Sedatives: Psychoactive substances that allay activity and excitement. In the *NIDA Household Survey on Drug Abuse*, the term sedatives refers to "barbiturates and other sedatives," also called "downers," that people take "to help them go to sleep or to help them calm down during the day or for some other reason."

Selected interventions: Interventions that focus specifically on high-risk groups.

Self-help groups for substance abusers: Support groups organized by and for substance abusers to help their members achieve and maintain abstinence from and/or cope with the effects of alcohol or illicit drugs. Examples are Alcoholics Anonymous and Narcotics Anonymous.

Self-report data: An indication of a survey respondent's attitudes, knowledge, or behavior that is reported by the respondent himself or herself.

Serious injuries: Injuries receiving a score of 3 or greater on the Maximum Abbreviated Injury Scale, a commonly used trauma severity scale.

Serious offenses: See *Part I offenses.*

Serious property offenses: For purposes of this Report, these are Federal Bureau of Investigation Part I property offenses—i.e., burglary, larceny-theft, motor vehicle theft, and arson. **Burglary** is the unlawful entry of a house or structure with the intention to commit a felony or a theft; it includes attempted forcible entry (e.g., by breaking a window). **Larceny theft** (excluding motor vehicle theft) is the unlawful taking, carrying, leading, or riding away of property from the possession or constructive possession of another or the stealing of any property or article which is not taken by force and violence or by fraud (e.g., thefts of bicycles, shoplifting, pocket-picking); it includes attempted larcenies. **Motor vehicle theft** is the theft or attempted theft of a motor vehicle that is self-propelled and runs on the ground (excluding airplanes, rail vehicles, farm equipment). **Arson** is any willful or malicious burning or attempt to burn with or without intent to defraud, a dwelling house, public building, motor vehicle, aircraft, personal property of another, etc.

Serious violent offenses: For purposes of this Report, these are Federal Bureau of Investigation Part I violent offenses against a person—i.e., murder and nonnegligent manslaughter, forcible rape, robbery, and aggravated assault. **Murder or nonnegligent manslaughter** is the willful (nonnegligent) killing of one human being by another. **Forcible rape** is gaining carnal knowledge of (having sexual intercourse with) a female forcibly and against her will; it includes rape by force and attempts or assaults to rape. **Robbery** is taking or attempting to take anything of value from the care, custody, or control of a person or persons by force or threat of force or violence and/or by putting the victim in fear. **Aggravated assault** is the unlawful intentional inflicting of serious bodily injury or death by means of a deadly or dangerous weapon with or without actual infliction of injury.

Seropositive: Showing a high level of antibody.

Seroprevalence: Prevalence based on blood tests.

Settlement houses: Institutions of the 19th century that provided various community services, especially to large city populations.

Sex education: Instruction about human sexual development, the process of reproduction, and related topics. Currently, the content and process of many sex education programs have been broadened, and such programs are often known as *family life education.*

Sexual abuse: As defined by DHHS's National Center on Child Abuse and Neglect, sexual abuse can take three forms: actual penile penetration; molestation with genital contact; and other unspecified acts not known to have involved actual genital contact (e.g., fondling of breasts or buttocks, exposure), or inadequate or inappropriate supervision of a child's voluntary sexual activities.

Sexual activity rate: As typically used in the literature, the number of individuals who have ever had sexual intercourse, per some population base.

Sexually active: As typically used in the literature, sexually active denotes ever having had sexual intercourse (as opposed to currently being sexually active).

Sexually transmitted disease (STD): Any infectious disease transmitted through sexual intercourse or genital contact. Examples are *chlamydial infection, gonorrhea, herpes genitalis, pelvic inflammatory disease (PID), syphilis, and AIDS.* Formerly (and sometimes, in law) called venereal disease.

Short-stay hospitals: As defined by DHHS's National Center for Health Statistics for the *National Hospital Discharge Survey,* hospitals in which the average length of stay is less than 30 days.

Short-term juvenile facilities: See *juvenile justice facilities.*

Sickle-cell disease: A lifelong disorder due to an inherited abnormality of the hemoglobin molecule, characterized by chronic anemia, a sickle-shaped deformity of red blood cells, and intermittent occlusions of the blood vessels.

Simplified Oral Hygiene Index (OHI-S): A measure of oral cleanliness and plaque control, with a low score denoting good oral hygiene.

Social competence: Competence in aspects of interpersonal interaction, including: managing social transactions such as entry into social situations; ability to maintain satisfying personal and work relationships; ability to resolve interpersonal problems so that there is both mutual satisfaction in the encounter and preservation of valued goals; ability to improvise effective plans of action in conflicted or disrupted situations; and ability to reduce stress and contain anxiety within manageable limits. The mediating factors affecting social competence that have been found to be susceptible to *life skills training* include the individual adolescent's: 1) motivation (i.e., to acquire knowledge and skills to enhance social competence); 2) knowledge base (i.e., about developmentally relevant health and social concerns); and 3) social skills (e.g., communication, empathy, ability to regulate one's own behavior).

Social environment: The aggregate of social and cultural conditions that influence the life of an individual or community. Aspects of the social environment particularly important to adolescents include the adolescents' families, other adults with whom adolescents come in contact, schools, workplaces, recreational facilities, and the media.

Social marketing: The design, implementation, and control of programs calculated to influence the acceptability of social ideas and involving considerations of product planning, primary, communications, distribution, and marketing research. It is different from health education in that it promotes specific products (e.g., condoms) rather than abstract ideas (e.g., disease prevention).

Social services: Services provided in order to support the functioning of individuals or family units, including those services termed: 1) "supportive" or "*protective services*"; 2) supplementary (i.e., financial assistance, home aid services (e.g., homemaker, caretaker, and parent aide services), respite care); and 3) "substitute" services (e.g., shelter services, *foster care,* adoption).

Social Services Block Grant Program: A Federal program, established by 1981 amendments to *Title XX of the Social Security Act,* of *block grants* to States for the provision of social services for the purpose of assisting individuals to: 1) achieve or maintain economic self-support; 2) achieve or maintain self-sufficiency; 3) prevent or remedy neglect, abuse, or exploitation of children and adults unable to protect their own interests; 4) prevent or reduce inappropriate institutional care; 5) secure referral or admission for institutional care when other forms of care are not appropriate, or provide services to individuals in institutions. Services that can be supported by social services block grants include *protective services;* employment, education, and training services for disabled people; *foster care* and adoption services; and health-related services (e.g., prevention, intervention, residential care). The program is administered at the Federal level by the Office of Human Development Services in DHHS.

Social support: Can involve the provision of any or all of: 1) supportive aid, including practical services and material benefits; 2) personal affirmation, including feedback that raises self-esteem and strengthens personal identity; and 3) supportive affect, particularly affection, caring, and nurturance. Compare *parental support programs.*

Socioeconomic status: Generally used in this Report as a synonym for income levels, typically those of an adolescent's family of origin. In some cases, however, socioeconomic status refers more broadly to a combination of factors such as father's education, mother's education, family income, father's occupation, and household items. See *poor, near-poor.*

Special Supplemental Food Program for Women, Infants, and Children (WIC): A program, administered at the Federal level by the Food and Nutrition Service of the U.S. Department of Agriculture, the purpose of which is to improve the health of low-income pregnant, breastfeeding and postpartum women, infants and children up to their fifth birthday by providing food packages designed to supplement each participant's diet with foods that nutritional research indicates are typically lacking in the WIC target population and by providing eligibles nutrition education and access to health services. Only 3 percent of those participating in the WIC program are pregnant, breastfeeding, or postpartum females under age 18.

Specialty mental health organizations: According to the National Institute of Mental Health (NIMH) in DHHS, any organizations designed primarily to provide mental health services. NIMH does not have a specific definition of a **mental health organization**. As part of its survey of mental health organizations, it collects data on patient care episodes from eight types of mental health organizations: *State and county mental hospitals*, private *psychiatric hospitals*, Department of Veterans Affairs (formerly Veterans Administration) psychiatric organizations, *general hospitals with separate psychiatric services*, *residential treatment centers* for emotionally disturbed children, *freestanding psychiatric partial care organizations*, and *multiservice mental health organizations*. The survey excludes data on patient care episodes outside of mental health organizations (e.g., in private offices of mental health providers).

Spermicides: Contraceptive agents that work by killing sperm. Spermicides come in various forms (e.g., jellies or creams to be used in *diaphragms*, contraceptive vaginal sponges, spermicidal condoms). Spermicides decrease the transmission of some *sexually transmitted diseases (STDs)*, including *gonorrhea*.

Standardized test: A test composed of a systematic sampling of behavior, administered and scored according to specific instructions, capable of being interpreted in terms of adequate norms, and for which there are data on reliability and validity.

Standard Metropolitan Statistical Area (SMSA): See *Metropolitan Statistical Area (SMA)*.

State and county mental hospital: A *psychiatric hospital* operated under the auspices of a State or a county government or operated jointly by both a State and county government.

Statistically significant: A judgment, based on commonly agreed to statistical principles, that there is relatively little likelihood (typically from below 1 to below 5 percent) that an observed relationship between or among *variables* has occurred by chance.

Status offenses: Offenses that are considered offenses only because they are committed by a minor (a person below age 18 or 19, depending on the State). Such offenses (e.g., purchase of intoxicating liquor, truancy, curfew violations) would not be considered offenses if committed by an adult. Under the Federal Bureau of Investigation's reporting system, status offenses are considered *Part II offenses*.

Stimulants: Psychoactive substances that stimulate the central nervous system, including *amphetamines*, caffeine, and *heroin*. In the *NIDA Household Survey on Drug Abuse*, the term stimulants refers to "amphetamines or other stimulants," also called "uppers," that people take "to help them lose weight or for some other reason." In the *Monitoring the Future/High School Seniors Survey*, the term similarly means amphetamines.

Street kid: A long-term *runaway*, *thrownaway*, or otherwise *homeless* child or adolescent who has become adept at fending for him or herself "on the street," usually by illegal activities.

Subclinical: Not detectable or producing effects that are not detectable by the usual clinical tests.

Subfamily: By U.S. Department of Commerce, Bureau of the Census, definition, a subfamily is a married couple with or without children, or one parent with one or more own never-married children under 18 years old, living in a *household* and either related or unrelated to the person or couple who maintains the household. One example of a **related subfamily** is a young married couple sharing the home of the husband's or wife's parents. An **unrelated subfamily** can include persons such as guests, partners, roommates, or resident employees and their spouses and/or children. Compare *unrelated persons*.

Subjective distress: Feelings of sadness, hopelessness, discouragement, boredom, stress, dissatisfaction, or being worn out or exhausted, that are *self-reported* by individuals but are not necessarily symptoms of *diagnosable mental disorders*.

Substance: See *psychoactive substances*.

Substance abuse: See *psychoactive substance abuse*.

Substance dependence: See *psychoactive substance dependence*.

Suicide and suicidal ideation: Suicide is the taking of one's own life. Suicidal ideation involves preoccupation with thoughts about committing suicide and may be a precursor to the act itself. Suicide and suicidal ideation are not diagnostic categories included in *DSM-III-R* but are behavioral symptoms of underlying problems, many, but not all, of which may relate to the mental health status of an individual.

Supply reduction substance use prevention strategies: Strategies related to the prevention of drug use and abuse that do not involve the delivery of personal health care services or attempt to change behavior by changing attitudes. Include restrictions on the manufacture, purchase, sale, possession, and use of alcohol and other drugs. Also sometimes considered "*health protection strategies*," to distinguish them from disease prevention and health promotion strategies. Compare *demand reduction substance use prevention strategies*.

Survival sex: Engaging in sexual intercourse in exchange for food, shelter, money, or drugs.

Syndrome: The aggregate of symptoms considered to constitute the characteristics of a morbid entity: used especially when the cause of the condition is unknown.

Syphilis: A *sexually transmitted disease (STD)* caused by the bacterial agent *Treponema pallidum*, resulting in symptoms including *chancre* (primary syphilis); skin rash, malaise, anorexia, nausea (secondary syphilis); and eventually, central nervous system abnormalities and other serious problems (tertiary syphilis).

Technology: The application of organized knowledge to practial ends. In 1978, OTA defined **medical technology** as the drugs, devices, and medical and surgical procedures used in medical care and the organizational and supportive systems within which such care is provided.

THC (tetrahydrocannobinol): The psychoactive ingredient in marijuana, hashish, and other preparations of hemp (*Cannabis sativa).*

Therapeutic alliance: An approach to *psychotherapy* which refers to the patient and therapist's collaborative effort in observing the patient's psychological processes. A replacement for outmoded notions of effective procedures in psychotherapy with children and adolescents.

Therapeutic foster care: In the spectrum of mental health services, the least restrictive type of residential (overnight) care. Therapeutic foster care essentially involves the following features: placement of a child with foster parents who have specifically been recruited to work with an emotionally disturbed child; provision of special training to the foster parents to assist them in working with the child; placement of only one child in each special foster home (with occasional exceptions); a low staff-to-client ratio, thereby allowing clinical staff to work very closely with each child, with the foster parents, and with the biological parents if they are available; creation of a support system among the foster parents; and payment of a special stipend to the foster parents for working with the emotionally disturbed child, and for participating in the training and other program activities. According to one group of observers, therapeutic foster care is simply conducting *foster care* at its best.

Third-party payment (for health care): Payment by a private health insurer or government program to a health care provider for care given to a patient.

Thrownaway: A child or adolescent who has been told to leave the household, has been abandoned or deserted, or who has run away and no effort has been made to recover him or her.

Title V of the Social Security Act: See *Maternal and Child Health Block Grant Program.*

Title XIX of the Social Security Act: See *Medicaid.*

Title XX of the Social Security Act: See *Social Services Block Grant Program.*

Title X family planning clinics: Family planning clinics that receive funds under Title X of the Public Health Service Act.

Title X program (Family Planning Services and Research Program) under the Public Health Service Act: A Federal program that provides Federal grants to help support about 4,000 family planning clinics operated by public or private nonprofit entities across the country, as well as funds for training and research to improve the delivery of family planning services. The Title X program is administered at the Federal level by the Office of Population Affairs within DHHS. In 1990, Congress appropriated $130 million for the Title X program. Family planning clinics that receive Title X funds offer contraceptives and other family planning services (not including abortion). The services offered by family planning clinics are provided free or at rates determined on a sliding-fee scale and are confidential. About one-third of the patients of such clinics are adolescents ages 15 to 19. See also *family planning services authorized by Title X of the Public Health Service Act.*

Title XX program (Adolescent Family Life Program) under the Public Health Service Act: A Federal program that awards Federal grants for demonstration projects that seek to prevent adolescent pregnancy by encouraging adolescents, within the context of the family, to abstain from premarital sexual activity and for demonstration projects that provide health and social services for pregnant or parenting adolescents. The Title XX program is administered by the Office of Population Affairs within DHHS. In fiscal year 1990, Congress appropriated $9.5 million for the Title XX program.

Tobacco: In this Report, cigarettes or other products prepared for smoking or chewing from the plant *Nicotiana tabacum*. Such products contain nicotine, a *psychoactive substance* associated with dependence.

Tracking: The assigning of students to a particular curricular track, usually on the basis of estimated ability.

Tranquilizers: Psychoactive substances that are prescribed as antianxiety or antipsychotic agents. Unlike sedatives, they produce their calming action without primary interference with consciousness and thinking.

Transitional living programs: Structured programs that provide shelter to runaway and homeless youth while helping them develop the skills they need to live on their own. The programs are authorized by the Runaway and Homeless Youth Act. Compare *independent living programs.*

Trauma: An injury to the body, especially one resulting from an external force; or a psychological shock, especially one having a lasting effect on the personality.

Treatment services: Services intended to cure or ameliorate the effects of a disease or other health problem once the problem has occurred. Compare *preventive health services.*

Trichomoniasis: Infection with the protozoa *Trichomonas.* **Vaginal trichomoniasis** is a *sexually transmitted disease (STD)* caused by infection with *Trichomonas vaginas,* found in the vagina and male genital tract. Vaginal trichomoniasis is sometimes symptomatic but may be manifested by severe *vaginitis* associated with discharge in females or with *urethritis* or *epididymitis* in males.

Unemployment rate: The numerator for calculating the unemployment rate is the number of civilians who had no employment but were available for work and: 1) had engaged in any specific jobseeking activity within the past 4 weeks, 2) were waiting to be called back to a job from which they had been laid off, or 3) were waiting to report to a new wage or salary job within 30 days. The denominator for calculating the unemployment rate is the **labor force.** In the second quarter of 1991, 66.2 percent (125,511,000 individuals) of the civilian noninstitutional population were estimated to be in the labor force; 8,553,000 individuals were estimated to be unemployed, and the unemployment rate (seasonally adjusted) was estimated to be 6.8 percent.

Unintended births: A combination of births arising from mistimed and unwanted pregnancies.

Unintentional injuries: See *accidental injuries.*

Universal interventions: Interventions for all members of a particular population.

Unprotected sexual intercourse: Sexual intercourse without precautions taken to prevent pregnancy or the transmission of *AIDS* or other *sexually transmitted diseases.*

Unrelated persons: As defined by the U.S. Department of Commerce, Bureau of the Census, **unrelated individuals** are persons of any age who are not members of *families* or *subfamilies.* Unrelated persons can also be members of **unrelated subfamilies.**

Urethritis: Inflammation of the urethra (the membranous canal conveying urine from the bladder to the exterior of the body).

Vaginitis: Inflammation of the vagina.

Variable: In an experiment, a factor that is changeable and subject to variation. The **independent variable** establishes the value of the **dependent variable(s)** when a defined relationship exists between them.

Veterans Administration psychiatric organization: An organization that is operated and controlled by the Veterans Administration and provides mental health services.

Victimization rate for an offense: The number of offenses experienced by a given population per some population base during a given time period. The victimization rate is analogous to the *incidence rate for an offense.*

Vital statistics system: See *national vital statistics system.*

Waived case: A case that is transferred from the juvenile court to the criminal court.

Work-loss day: As defined by the *National Health Interview Survey* conducted by DHHS, any day on which an individual did not work at his or her job or business for at least part of his or her normal workday because of a specific illness or injury. The number of work-loss days is determined only for currently employed persons. See also *restricted-activity day.*

Younger adolescents: As defined in most DHHS data analyses, adolescents ages 10 to 14. Compare *older adolescents.*

Youth Risk Behavior Surveillance System (YRBSS): This system, recently developed by the Centers for Disease Control in DHHS, will monitor the prevalence of priority risk behaviors among samples of school-aged adolescents by collecting data from a periodic school-based survey combined with special supplemental data on youth risk behavior from the *National Health Interview Survey* conducted by DHHS. The system will be implemented in 1991, 1995, and 2000.

Zidovudine (Retrovir^R): A drug used to reduce symptoms prolonging the lives of persons infected with *human immunodeficiency virus (HIV).* This drug was formerly called azidothymidine (AZT).

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Note: This index incorporates key terms from Volume I, II, and III of OTA's Report, *Adolescent Health*. The index is also available as a separate document from OTA (202/224-8996).

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